[DISCUSSION DRAFT]

SEPTEMBER 29, 2003

TITLE IX—RESEARCH AND DEVELOPMENT

SEC. 901. GOALS.

(a) IN GENERAL.—The Secretary shall conduct a balanced set of programs of energy research, development, demonstration, and commercial application to support Federal energy policy and programs by the Department. Such programs shall be focused on—

(1) increasing the efficiency of all energy intensive sectors through conservation and improved technologies;

(2) promoting diversity of energy supply;

(3) decreasing the Nation's dependence on foreign energy supplies;

(4) improving United States energy security; and

(5) decreasing the environmental impact of energy-related activities.

(b) GOALS.—The Secretary shall publish measurable 5-year cost and performance-based goals with each annual budget submission in at least the following areas:

(1) Energy efficiency for buildings, energy-consuming industries, and vehicles.

(2) Electric energy generation (including distributed generation), transmission, and storage.

(3) Renewable energy technologies including wind power, photovoltaics, solar thermal systems, geothermal energy, hydrogen-fueled systems, biomass-based systems, biofuels, and hydropower.

(4) Fossil energy including power generation, onshore and offshore oil and gas resource recovery, and transportation.

(5) Nuclear energy including programs for existing and advanced reactors and education of future specialists.

(c) PUBLIC COMMENT.—The Secretary shall provide mechanisms for input on the annually published goals from industry, university, and other public sources.

(d) EFFECT OF GOALS.—Nothing in subsection (a) or the annually published goals creates any new authority for any Federal agency, or may be used by a Federal agency to support the establishment of regulatory standards or regulatory requirements.

SEC. 902. DEFINITIONS.

For purposes of this title:

(1) The term ''Department'' means the Department of Energy.

(2) The term ''departmental mission'' means any of the functions vested in the Secretary of Energy by the Department of Energy Organization Act (42 U.S.C. 7101 et seq.) or other law.

(3) The term ''institution of higher education'' has the meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(4) The term ''National Laboratory'' means any of the following laboratories owned by the Department:

(A) Ames Laboratory.

(B) Argonne National Laboratory.

(C) Brookhaven National Laboratory.

(D) Fermi National Accelerator Laboratory.

(E) Idaho National Engineering and Environmental Laboratory.

(F) Lawrence Berkeley National Laboratory.

(G) Lawrence Livermore National Laboratory.

(H) Los Alamos National Laboratory.

(I) National Energy Technology Laboratory.

(J) National Renewable Energy Laboratory.

(K) Oak Ridge National Laboratory.

(L) Pacific Northwest National Laboratory.

(M) Princeton Plasma Physics Laboratory.

(N) Sandia National Laboratories.

(O) Stanford Linear Accelerator Center.

(P) Thomas Jefferson National Accelerator Facility.

(5) The term ''nonmilitary energy laboratory'' means the laboratories listed in paragraph (4), except for those listed in subparagraphs (G), (H), and (N).

(6) The term ''Secretary'' means the Secretary of Energy.

(7) The term ''single-purpose research facility'' means any of the primarily single-purpose entities owned by the Department or any other organization of the Department designated by the Secretary.

Subtitle A—Energy Efficiency

SEC. 904. ENERGY EFFICIENCY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for energy efficiency and conservation research, development, dem-

onstration, and commercial application activities, including activities authorized under this subtitle:

(1) For fiscal year 2004, $616,000,000.

(2) For fiscal year 2005, $695,000,000.

(3) For fiscal year 2006, $772,000,000.

(4) For fiscal year 2007, $865,000,000.

(5) For fiscal year 2008, $920,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) For activities under section 905—

(A) for fiscal year 2004, $20,000,000;

(B) for fiscal year 2005, $30,000,000;

(C) for fiscal year 2006, $50,000,000;

(D) for fiscal year 2007, $50,000,000; and

(E) for fiscal year 2008, $50,000,000.

(2) For activities under section 907—

(A) for fiscal year 2004, $4,000,000; and

(B) for each of fiscal years 2005 through 2008, $7,000,000.

(3) For activities under section 908—

(A) for fiscal year 2004, $20,000,000;

(B) for fiscal year 2005, $25,000,000;

(C) for fiscal year 2006, $30,000,000;

(D) for fiscal year 2007, $35,000,000; and

(E) for fiscal year 2008, $40,000,000.

(4) For activities under section 909, $2,000,000 for each of fiscal years 2005 through 2008.

(c) EXTENDED AUTHORIZATION.—There are authorized to be appropriated to the Secretary for activities under section 905, $50,000,000 for each of fiscal years 2009 through 2013.

(d) LIMITATION ON USE OF FUNDS.—None of the funds authorized to be appropriated under this section may be used for—

(1) the promulgation and implementation of energy efficiency regulations;

(2) the Weatherization Assistance Program under part A of title IV of the Energy Conservation and Production Act;

(3) the State Energy Program under part D of title III of the Energy Policy and Conservation Act; or

(4) the Federal Energy Management Program under part 3 of title V of the National Energy Conservation Policy Act.

SEC. 905. NEXT GENERATION LIGHTING INITIATIVE.

(a) IN GENERAL.—The Secretary shall carry out a Next Generation Lighting Initiative in accordance with this section to support research, development, demonstra-

tion, and commercial application activities related to advanced solid-state lighting technologies based on white light emitting diodes.

(b) OBJECTIVES.—The objectives of the initiative shall be to develop advanced solid-state organic and inorganic lighting technologies based on white light emitting diodes that, compared to incandescent and fluorescent lighting technologies, are longer lasting; more energy-efficient; cost-competitive and have less environmental impact.

(c) INDUSTRY ALLIANCE.—The Secretary shall, within 3 months from the date of enactment of this section, competitively select an Industry Alliance to represent participants that are private, for-profit firms which, as a group, are broadly representative of United States solid state lighting research, development, infrastructure, and manufacturing expertise as a whole.

(d) RESEARCH.—(1) The Secretary shall carry out the research activities of the Next Generation Lighting Initiative through competitively awarded grants to researchers, including Industry Alliance participants, National Laboratories, and institutions of higher education.

(2) The Secretary shall annually solicit from the Industry Alliance—

(A) comments to identify solid-state lighting technology needs;

(B) assessment of the progress of the Initiative's research activities; and

(C) assistance in annually updating solid-state lighting technology roadmaps.

(3) The information and roadmaps under paragraph (2) shall be available to the public and public response shall be solicited by the Secretary.

(e) DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.—The Secretary shall carry out a development, demonstration, and commercial application program for the Next Generation Lighting Initiative through competitively selected awards. The Secretary may give preference to participants of the Industry Alliance selected pursuant to subsection (c).

(f) COST SHARING.—The Secretary shall require cost sharing according to section 972.

(g) INTELLECTUAL PROPERTY.—The Secretary may require, in accordance with the authorities provided in section 202(a)(ii) of title 35, United States Code, section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182), and section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5908), that—

(1) for any new invention resulting from activities under subsection (d)—

(A) the Industry Alliance members that are active participants in research, development, and demonstration activities related to the advanced solid-state lighting technologies that are the subject of this section shall be granted first option to negotiate with the invention owner, at least in the field of solid-state lighting, nonexclusive licenses and royalties on terms that are reasonable under the circumstances; and

(B) the invention owner must offer to negotiate nonexclusive licenses with the Industry Alliance participants described in subparagraph (A), in good faith, for at least 1 year after United States patents are issued on the invention; and

(2) such other terms as the Secretary determines are required to promote accelerated commercialization of inventions made under the Initiative.

(h) NATIONAL ACADEMY REVIEW.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct periodic reviews of the Next Generation Lighting Initiative. The Academy shall review the research priorities, technical milestones, and plans for

technology transfer and progress towards achieving them. The Secretary shall consider the results of such reviews in evaluating the information obtained under subsection (d)(2).

(i) DEFINITIONS.—As used in this section:

(1) The term ''advanced solid-state lighting'' means a semiconducting device package and delivery system that produces white light using externally applied voltage.

(2) The term ''research'' includes research on the technologies, materials, and manufacturing processes required for white light emitting diodes.

(3) The term ''Industry Alliance'' means an entity selected by the Secretary under subsection (c).

(4) The term ''white light emitting diode'' means a semiconducting package, utilizing either organic or inorganic materials, that produces white light using externally applied voltage.

SEC. 906. NATIONAL BUILDING PERFORMANCE INITIATIVE.

(a) INTERAGENCY GROUP.—Not later than 90 days after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall establish an interagency group to develop, in coordination with the advisory committee established under subsection (e), a National Building Performance Initiative (in this section

referred to as the ''Initiative''). The interagency group shall be co-chaired by appropriate officials of the Department and the Department of Commerce, who shall jointly arrange for the provision of necessary administrative support to the group.

(b) INTEGRATION OF EFFORTS.—The Initiative, working with the National Institute of Building Sciences, shall integrate Federal, State, and voluntary private sector efforts to reduce the costs of construction, operation, maintenance, and renovation of commercial, industrial, institutional, and residential buildings.

(c) PLAN.—Not later than 1 year after the date of enactment of this Act, the interagency group shall submit to Congress a plan for carrying out the appropriate Federal role in the Initiative. The plan shall include—

(1) research, development, demonstration, and commercial application of systems and materials for new construction and retrofit relating to the building envelope and building system components; and

(2) the collection, analysis, and dissemination of research results and other pertinent information on enhancing building performance to industry, government entities, and the public.

(d) DEPARTMENT OF ENERGY ROLE.—Within the Federal portion of the Initiative, the Department shall be

the lead agency for all aspects of building performance related to use and conservation of energy.

(e) ADVISORY COMMITTEE.—

(1) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy shall establish an advisory committee to—

(A) analyze and provide recommendations on potential private sector roles and participation in the Initiative; and

(B) review and provide recommendations on the plan described in subsection (c).

(2) MEMBERSHIP.—Membership of the advisory committee shall include representatives with a broad range of appropriate expertise, including expertise in—

(A) building research and technology;

(B) architecture, engineering, and building materials and systems; and

(C) the residential, commercial, and industrial sectors of the construction industry.

(f) CONSTRUCTION.—Nothing in this section provides any Federal agency with new authority to regulate building performance.

SEC. 907. SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.

(a) DEFINITIONS.—For purposes of this section:

(1) The term 'battery'' means an energy storage device that previously has been used to provide motive power in a vehicle powered in whole or in part by electricity.

(2) The term ''associated equipment'' means equipment located where the batteries will be used that is necessary to enable the use of the energy stored in the batteries.

(b) PROGRAM.—The Secretary shall establish and conduct a research, development, demonstration, and commercial application program for the secondary use of batteries if the Secretary finds that there are sufficient numbers of such batteries to support the program. The program shall be—

(1) designed to demonstrate the use of batteries in secondary applications, including utility and commercial power storage and power quality;

(2) structured to evaluate the performance, including useful service life and costs, of such batteries in field operations, and the necessary supporting infrastructure, including reuse and disposal of batteries; and

(3) coordinated with ongoing secondary battery use programs at the National Laboratories and in industry.

(c) SOLICITATION.—Not later than 180 days after the date of enactment of this Act, if the Secretary finds under subsection (b) that there are sufficient numbers of batteries to support the program, the Secretary shall solicit proposals to demonstrate the secondary use of batteries and associated equipment and supporting infrastructure in geographic locations throughout the United States. The Secretary may make additional solicitations for proposals if the Secretary determines that such solicitations are necessary to carry out this section.

(d) SELECTION OF PROPOSALS.—(1) The Secretary shall, not later than 90 days after the closing date established by the Secretary for receipt of proposals under subsection (c), select up to 5 proposals which may receive financial assistance under this section once the Department is in receipt of appropriated funds.

(2) In selecting proposals, the Secretary shall consider diversity of battery type, geographic and climatic diversity, and life-cycle environmental effects of the approaches.

(3) No one project selected under this section shall receive more than 25 percent of the funds authorized for this Program.

(4) The Secretary shall consider the extent of involvement of State or local government and other persons in each demonstration project to optimize use of Federal resources.

(5) The Secretary may consider such other criteria as the Secretary considers appropriate.

(e) CONDITIONS.—The Secretary shall require that—

(1) relevant information be provided to the Department, the users of the batteries, the proposers, and the battery manufacturers;

(2) the proposer provide at least 50 percent of the costs associated with the proposal; and

(3) the proposer provide to the Secretary such information regarding the disposal of the batteries as the Secretary may require to ensure that the proposer disposes of the batteries in accordance with applicable law.

SEC. 908. ENERGY EFFICIENCY SCIENCE INITIATIVE.

(a) ESTABLISHMENT.—The Secretary shall establish an Energy Efficiency Science Initiative to be managed by the Assistant Secretary in the Department with responsibility for energy conservation under section 203(a)(9) of

the Department of Energy Organization Act (42 U.S.C. 7133(a)(9)), in consultation with the Director of the Office of Science, for grants to be competitively awarded and subject to peer review for research relating to energy efficiency.

(b) REPORT.—The Secretary shall submit to the Congress, along with the President's annual budget request under section 1105(a) of title 31, United States Code, a report on the activities of the Energy Efficiency Science Initiative, including a description of the process used to award the funds and an explanation of how the research relates to energy efficiency.

SEC. 909. ELECTRIC MOTOR CONTROL TECHNOLOGY.

The Secretary shall conduct a research, development, demonstration, and commercial application program on advanced control devices to improve the energy efficiency of electric motors used in heating, ventilation, air conditioning, and comparable systems.

SEC. 910. ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS.

(a) GRANTS.—Not later than 18 months after the date of enactment of this Act, the Secretary shall make grants to nonprofit institutions, State and local governments, or universities (or consortia thereof), to establish a geographically dispersed network of Advanced Energy

Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers.

(b) ACTIVITIES.—(1) Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use.

(2) Each Center shall establish an advisory panel to advise the Center on how best to accomplish the activities under paragraph (1).

(c) APPLICATION.—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section.

(d) SELECTION CRITERIA.—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

(1) The ability of the applicant to carry out the activities in subsection (b).

(2) The extent to which the applicant will coordinate the activities of the Center with other enti-

ties, such as State and local governments, utilities, and educational and research institutions.

(e) MATCHING FUNDS.—The Secretary shall require a non-Federal matching requirement of at least 50 percent of the costs of establishing and operating each Center.

(f) ADVISORY COMMITTEE.—The Secretary shall establish an advisory committee to advise the Secretary on the establishment of Centers under this section. The advisory committee shall be composed of individuals with expertise in the area of advanced energy methods and technologies, including at least 1 representative from—

(1) State or local energy offices;

(2) energy professionals;

(3) trade or professional associations;

(4) architects, engineers, or construction professionals;

(5) manufacturers;

(6) the research community; and

(7) nonprofit energy or environmental organizations.

(g) DEFINITIONS.—For purposes of this section—

(1) the term ''advanced energy methods and technologies'' means all methods and technologies that promote energy efficiency and conservation, in-

cluding distributed generation technologies, and life-cycle analysis of energy use;

(2) the term ''Center'' means an Advanced Energy Technology Transfer Center established pursuant to this section; and

(3) the term ''distributed generation'' means an electric power generation facility that is designed to serve retail electric consumers at or near the facility site.

Subtitle B—Distributed Energy and Electric Energy Systems

SEC. 911. DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for distributed energy and electric energy systems activities, including activities authorized under this subtitle:

(1) For fiscal year 2004, $190,000,000.

(2) For fiscal year 2005, $200,000,000.

(3) For fiscal year 2006, $220,000,000.

(4) For fiscal year 2007, $240,000,000.

(5) For fiscal year 2008, $260,000,000.

(b) MICRO-COGENERATION ENERGY TECHNOLOGY.—From amounts authorized under subsection

(a), $20,000,000 for each of fiscal years 2004 and 2005 shall be available for activities under section 914.

SEC. 912. HYBRID DISTRIBUTED POWER SYSTEMS.

(a) REQUIREMENT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall develop and transmit to the Congress a strategy for a comprehensive research, development, demonstration, and commercial application program to develop hybrid distributed power systems that combine—

(1) one or more renewable electric power generation technologies of 10 megawatts or less located near the site of electric energy use; and

(2) nonintermittent electric power generation technologies suitable for use in a distributed power system.

(b) CONTENTS.—The strategy shall—

(1) identify the needs best met with such hybrid distributed power systems and the technological barriers to the use of such systems;

(2) provide for the development of methods to design, test, integrate into systems, and operate such hybrid distributed power systems;

(3) include, as appropriate, research, development, demonstration, and commercial application on related technologies needed for the adoption of such

hybrid distributed power systems, including energy storage devices and environmental control technologies;

(4) include research, development, demonstration, and commercial application of interconnection technologies for communications and controls of distributed generation architectures, particularly technologies promoting real-time response to power market information and physical conditions on the electrical grid; and

(5) describe how activities under the strategy will be integrated with other research, development, demonstration, and commercial application activities supported by the Department of Energy related to electric power technologies.

SEC. 913. HIGH POWER DENSITY INDUSTRY PROGRAM.

The Secretary shall establish a comprehensive research, development, demonstration, and commercial application program to improve energy efficiency of high power density facilities, including data centers, server farms, and telecommunications facilities. Such program shall consider technologies that provide significant improvement in thermal controls, metering, load management, peak load reduction, or the efficient cooling of electronics.

SEC. 914. MICRO-COGENERATION ENERGY TECHNOLOGY.

The Secretary shall make competitive, merit-based grants to consortia for the development of micro-cogeneration energy technology. The consortia shall explore the use of small-scale combined heat and power in residential heating appliances and, the use of excess power to operate other appliances within the residence and supply excess generated power to the power grid.

SEC. 915. DISTRIBUTED ENERGY TECHNOLOGY DEMONSTRATION PROGRAM.

The Secretary, within the sums authorized under section 911(a), may provide financial assistance to coordinating consortia of interdisciplinary participants for demonstrations designed to accelerate the utilization of distributed energy technologies, such as fuel cells, microturbines, reciprocating engines, thermally activated technologies, and combined heat and power systems, in highly energy intensive commercial applications.

SEC. 916. RECIPROCATING POWER.

The Secretary shall conduct a research, development, and demonstration program regarding fuel system optimization and emissions reduction after-treatment technologies for industrial reciprocating engines. Such after-treatment technologies shall use processes that reduce emissions by recirculating exhaust gases and shall be designed to be retrofitted to any new or existing diesel or

natural gas engine used for power generation, peaking power generation, combined heat and power, or compression.

[SEC. 917. ADVANCED POWER SYSTEM TECHNOLOGY INCENTIVE PROGRAM.

(a) PROGRAM.—The Secretary of Energy is authorized to establish an Advanced Power System Technology Incentive Program to support the deployment of certain advanced power system technologies and to improve and protect certain critical governmental, industrial, and commercial processes. Funds provided under this section shall be used by the Secretary to make incentive payments to eligible owners or operators of advanced power system technologies to increase power generation through enhanced operational, economic, and environmental performance. Payments under this section may only be made upon receipt by the Secretary of an incentive payment application establishing an applicant as either—

(1) a qualifying advanced power system technology facility; or

(2) a qualifying security and assured power facility.

(b) INCENTIVES.—Subject to availability of funds, a payment of 1.8 cents per kilowatt-hour shall be paid to the owner or operator of a qualifying advanced power sys-

tem technology facility under this section for electricity generated at such facility. An additional 0.7 cents per kilowatt-hour shall be paid to the owner or operator of a qualifying security and assured power facility for electricity generated at such facility. Any facility qualifying under this section shall be eligible for an incentive payment for up to, but not more than, the first 10,000,000 kilowatt-hours produced in any fiscal year.

(c) ELIGIBILITY.—For purposes of this section—

(1) the term ''qualifying advanced power system technology facility'' means a facility using an advanced fuel cell, turbine, or hybrid power system or power storage system to generate or store electric energy; and

(2) the term ''qualifying security and assured power facility'' means a qualifying advanced power system technology facility determined by the Secretary, in consultation with the Secretary of Homeland Security, to be in critical need of secure, reliable, rapidly available, high-quality power for critical governmental, industrial, or commercial applications.

(d) AUTHORIZATION.—There are authorized to be appropriated to the Secretary for the purposes of this section, $10,000,000 for each of the fiscal years 2004 through 2010.]

Subtitle C—Renewable Energy

SEC. 918. RENEWABLE ENERGY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for renewable energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle:

(1) For fiscal year 2004, $480,000,000.

(2) For fiscal year 2005, $550,000,000.

(3) For fiscal year 2006, $610,000,000.

(4) For fiscal year 2007, $659,000,000.

(5) For fiscal year 2008, $710,000,000.

(b) BIOENERGY.—From the amounts authorized under subsection (a), the following sums are authorized to be appropriated to carry out section 919:

(1) For fiscal year 2004, $135,425,000.

(2) For fiscal year 2005, $155,600,000.

(3) For fiscal year 2006, $167,650,000.

(4) For fiscal year 2007, $180,000,000.

(5) For fiscal year 2008, $192,000,000.

(c) CONCENTRATING SOLAR POWER.—From amounts authorized under subsection (a), the following sums are authorized to be appropriated to carry out section 920:

(1) For fiscal year 2004, $20,000,000.

(2) For fiscal year 2005, $40,000,000.

(3) For each of fiscal years 2006, 2007 and 2008, $50,000,000.

(d) PUBLIC BUILDINGS.—From the amounts authorized under subsection (a), $30,000,000 for each of the fiscal years 2004 through 2008 are authorized to be appropriated to carry out section 922.

(e) LIMITS ON USE OF FUNDS.—(1) None of the funds authorized to be appropriated under this section may be used for Renewable Support and Implementation.

(2) Of the funds authorized under subsection (b), not less than $5,000,000 for each fiscal year shall be made available for grants to Historically Black Colleges and Universities, Tribal Colleges, and Hispanic-Serving Institutions.

(3) Of the funds authorized under subsection (a), not less than $4,000,000 for each fiscal year shall be made available for the Regional Field Verification Program of the Department.

(4) Of the funds authorized under subsection (a), such sums as may be necessary shall be made available for demonstration projects of off-stream pumped storage hydropower.

(f) CONSULTATION.—In carrying out this subtitle, the Secretary, in consultation with the Secretary of Agri-

culture, shall demonstrate the use of advanced wind power technology, including combined use with coal gasification; biomass; geothermal energy systems; and other renewable energy technologies to assist in delivering electricity to rural and remote locations.

SEC. 919. BIOENERGY PROGRAMS.

(a) DEFINITION.—For the purposes of this section:

(1) The term ''cellulosic biomass'' means any portion of a crop containing lignocellulose or hemicellulose or any crop grown specifically for the purpose of producing cellulosic feedstocks.

(2) The term ''agricultural byproducts'' includes rice straw, rice hulls, soybean matter, poultry fat, poultry waste, sugarcane bagasse, forest thinnings, grapeseed, rice bran, and barley grain.

(b) PROGRAM.—The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including—

(1) biopower energy systems;

(2) biofuels;

(3) bio-based products;

(4) integrated biorefineries that may produce biopower, biofuels, and bio-based products;

(5) cross-cutting research and development in feedstocks and enzymes; and

(6) economic analysis.

(c) BIOFUELS AND BIO-BASED PRODUCTS.—The goals of the biofuels and bio-based products programs shall be to develop, in partnership with industry—

(1) advanced biochemical and thermochemical conversion technologies capable of making biofuels and bio-based products from a variety of feedstocks, including grains, cellulosic biomass, and other agricultural byproducts, that are price-competitive with gasoline or diesel in either internal combustion engines or fuel cell-powered vehicles; and

(2) advanced biotechnology processes capable of making biofuels and bio-based products with emphasis on development of biorefinery technologies using enzyme-based processing systems.

SEC. 920. CONCENTRATING SOLAR POWER RESEARCH PROGRAM.

(a) IN GENERAL.—The Secretary shall conduct a program of research and development to evaluate the potential of concentrating solar power for hydrogen production, including cogeneration approaches for both hydrogen and electricity. Such program shall take advantage of existing facilities to the extent possible and shall include—

(1) development of optimized technologies that are common to both electricity and hydrogen production;

(2) evaluation of thermochemical cycles for hydrogen production at the temperatures attainable with concentrating solar power;

(3) evaluation of materials issues for the thermochemical cycles described in paragraph (2);

(4) system architectures and economics studies; and

(5) coordination with activities in the Advanced Reactor Hydrogen Cogeneration Project on high temperature materials, thermochemical cycle and economic issues.

(b) ASSESSMENT.—In carrying out the program under this section, the Secretary shall assess conflicting guidance on the economic potential of concentrating solar power for electricity production received from the National Research Council report entitled ''Renewable Power Pathways: A Review of the U.S. Department of Energy's Renewable Energy Programs'' in 2000 and subsequent Department-funded reviews of that report and provide an assessment of the potential impact of the technology before, or concurrent with, submission of the fiscal year 2006 budget.

(c) REPORT.—Not later than 5 years after the date of enactment of this Act, the Secretary shall provide a report to Congress on the economic and technical potential for electricity or hydrogen production, with or without cogeneration, with concentrating solar power, including the economic and technical feasibility of potential construction of a pilot demonstration facility suitable for commercial production of electricity or hydrogen from concentrating solar power.

SEC. 921. MISCELLANEOUS PROJECTS.

The Secretary may conduct research, development, demonstration, and commercial application programs for—

(1) ocean energy, including wave energy; and

(2) the combined use of renewable energy technologies with one another and with other energy technologies, including the combined use of wind power and coal gasification technologies.

SEC. 922. RENEWABLE ENERGY IN PUBLIC BUILDINGS.

(a) DEMONSTRATION AND TECHNOLOGY TRANSFER PROGRAM.—The Secretary shall establish a program for the demonstration of innovative technologies for solar and other renewable energy sources in buildings owned or operated by a State or local government, and for the dissemi-

nation of information resulting from such demonstration to interested parties.

(b) LIMIT ON FEDERAL FUNDING.—The Secretary shall provide under this section no more than 40 percent of the incremental costs of the solar or other renewable energy source project funded.

(c) REQUIREMENT.—As part of the application for awards under this section, the Secretary shall require all applicants—

(1) to demonstrate a continuing commitment to the use of solar and other renewable energy sources in buildings they own or operate; and

(2) to state how they expect any award to further their transition to the significant use of renewable energy.

SEC. 923. STUDY OF MARINE RENEWABLE ENERGY OPTIONS.

(a) IN GENERAL.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a study on—

(1) the feasibility of various methods of renewable generation of energy from the ocean, including energy from waves, tides, currents, and thermal gradients; and

(2) the research, development, demonstration, and commercial application activities required to make marine renewable energy generation competitive with other forms of electricity generation.

(b) TRANSMITTAL.—Not later than 1 year after the date of the enactment of this Act, the Secretary shall transmit the study to the Congress along with the Secretary's recommendations for implementing the results of the study.

Subtitle D—Nuclear Energy

SEC. 924. NUCLEAR ENERGY.

(a) CORE PROGRAMS.—The following sums are authorized to be appropriated to the Secretary for nuclear energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle, other than those described in subsection (b):

(1) For fiscal year 2004, $273,000,000.

(2) For fiscal year 2005, $355,000,000.

(3) For fiscal year 2006, $430,000,000.

(4) For fiscal year 2007, $455,000,000.

(5) For fiscal year 2008, $545,000,000.

(b) NUCLEAR INFRASTRUCTURE SUPPORT.—The following sums are authorized to be appropriated to the Secretary for activities under section 925(f):

(1) For fiscal year 2004, $125,000,000.

(2) For fiscal year 2005, $130,000,000.

(3) For fiscal year 2006, $135,000,000.

(4) For fiscal year 2007, $140,000,000.

(5) For fiscal year 2008, $145,000,000.

(c) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) For activities under section 926—

(A) for fiscal year 2004, $140,000,000;

(B) for fiscal year 2005, $145,000,000;

(C) for fiscal year 2006, $150,000,000;

(D) for fiscal year 2007, $155,000,000; and

(E) for fiscal year 2008, $275,000,000.

(2) For activities under section 927—

(A) for fiscal year 2004, $35,200,000;

(B) for fiscal year 2005, $44,350,000;

(C) for fiscal year 2006, $49,200,000;

(D) for fiscal year 2007, $54,950,000; and

(E) for fiscal year 2008, $60,000,000.

(3) For activities under section 929, for each of fiscal years 2004 through 2008, $6,000,000.

(d) LIMITATION ON USE OF FUNDS.—None of the funds authorized under this section may be used for decommissioning the Fast Flux Test Facility.

SEC. 925. NUCLEAR ENERGY RESEARCH PROGRAMS.

(a) NUCLEAR ENERGY RESEARCH INITIATIVE.—The Secretary shall carry out a Nuclear Energy Research Initiative for research and development related to nuclear energy.

(b) NUCLEAR ENERGY PLANT OPTIMIZATION PROGRAM.—The Secretary shall carry out a Nuclear Energy Plant Optimization Program to support research and development activities addressing reliability, availability, productivity, component aging, safety, and security of existing nuclear power plants.

(c) NUCLEAR POWER 2010 PROGRAM.—The Secretary shall carry out a Nuclear Power 2010 Program, consistent with recommendations in the October 2001 report entitled ''A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010'' issued by the Nuclear Energy Research Advisory Committee of the Department. Whatever type of reactor is chosen for the hydrogen cogeneration project under subtitle C of title VI, that type shall not be addressed in the Program under this section. The Program shall include—

(1) support for first-of-a-kind engineering design and certification expenses of advanced nuclear power plant designs, which offer improved safety and economics over current conventional plants and

the promise of near-term to medium-term commercial deployment;

(2) action by the Secretary to encourage domestic power companies to install new nuclear plant capacity as soon as possible;

(3) cost sharing with industry for projects beyond the research stage;

(4) utilization of the expertise and capabilities of industry, universities, and National Laboratories in evaluation of advanced nuclear fuel cycles and fuels testing;

(5) consideration of proliferation-resistant passively-safe, small reactors suitable for long-term electricity production, without refueling, suitable for use in remote installations;

(6) participation of international collaborators in research, development, design, and deployment efforts as appropriate;

(7) encouragement for university and industry participation; and

(8) selection of projects such as to strengthen the competitive position of the domestic nuclear power industrial infrastructure.

(d) GENERATION IV NUCLEAR ENERGY SYSTEMS INITIATIVE.—The Secretary shall carry out a Generation

IV Nuclear Energy Systems Initiative to develop an overall technology plan and to support research and development necessary to make an informed technical decision about the most promising candidates for eventual commercial application. The Initiative shall examine advanced proliferation-resistant and passively safe reactor designs, including designs that—

(1) are economically competitive with other electric power generation plants;

(2) have higher efficiency, lower cost, and improved safety compared to reactors in operation on the date of enactment of this Act;

(3) use fuels that are proliferation-resistant and have substantially reduced production of high-level waste per unit of output; and

(4) use improved instrumentation.

(e) NUCLEAR INFRASTRUCTURE SUPPORT.—The Secretary shall develop and implement a strategy for the facilities of the Office of Nuclear Energy, Science, and Technology and shall transmit a report containing the strategy along with the President's budget request to the Congress for fiscal year 2006.

SEC. 926. ADVANCED FUEL CYCLE INITIATIVE.

(a) IN GENERAL.—The Secretary, through the Director of the Office of Nuclear Energy, Science, and Tech-

nology, shall conduct an advanced fuel recycling technology research and development program to evaluate proliferation-resistant fuel recycling and transmutation technologies that minimize environmental or public health and safety impacts as an alternative to aqueous reprocessing technologies deployed as of the date of enactment of this Act in support of evaluation of alternative national strategies for spent nuclear fuel and the Generation IV advanced reactor concepts, subject to annual review by the Secretary's Nuclear Energy Research Advisory Committee or other independent entity, as appropriate. Opportunities to enhance progress of the program through international cooperation should be sought.

(b) REPORTS.—The Secretary shall report on the activities of the advanced fuel recycling technology research and development program as part of the Department's annual budget submission.

SEC. 927. UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING SUPPORT.

(a) ESTABLISHMENT.—The Secretary shall support a program to invest in human resources and infrastructure in the nuclear sciences and engineering and related fields (including health physics and nuclear and radiochemistry), consistent with departmental missions related to civilian nuclear research and development.

(b) DUTIES.—In carrying out the program under this section, the Secretary shall establish fellowship and faculty assistance programs, as well as provide support for fundamental research and encourage collaborative research among industry, National Laboratories, and universities through the Nuclear Energy Research Initiative. The Secretary is encouraged to support activities addressing the entire fuel cycle through involvement of both the Office of Nuclear Energy, Science, and Technology and the Office of Civilian Radioactive Waste Management. The Secretary shall support communication and outreach related to nuclear science, engineering, and nuclear waste management, consistent with United States interests in nonproliferation of nuclear weapons capabilities.

(c) STRENGTHENING UNIVERSITY RESEARCH AND TRAINING REACTORS AND ASSOCIATED INFRASTRUCTURE.—Activities under this section may include—

(1) converting research and training reactors currently using high-enrichment fuels to low-enrichment fuels, upgrading operational instrumentation, and sharing of reactors among institutions of higher education;

(2) providing technical assistance, in collaboration with the United States nuclear industry, in reli-

censing and upgrading research and training reactors as part of a student training program; and

(3) providing funding, through the Innovations in Nuclear Infrastructure and Education Program, for reactor improvements as part of a focused effort that emphasizes research, training, and education.

(d) UNIVERSITY NATIONAL LABORATORY INTERACTIONS.—The Secretary shall develop sabbatical fellowship and visiting scientist programs to encourage sharing of personnel between National Laboratories and universities.

(e) OPERATING AND MAINTENANCE COSTS.—Funding for a research project provided under this section may be used to offset a portion of the operating and maintenance costs of a research and training reactor at an institution of higher education used in the research project.

SEC. 928. SECURITY OF REACTOR DESIGNS.

The Secretary, through the Director of the Office of Nuclear Energy, Science, and Technology shall conduct a research and development program on cost-effective technologies for increasing the safety of reactor designs from natural phenomena and the security of reactor designs from deliberate attacks.

SEC. 929. ALTERNATIVES TO INDUSTRIAL RADIOACTIVE SOURCES.

(a) STUDY.—The Secretary shall conduct a study and provide a report to the Congress not later than August 1, 2004. The study shall—

(1) survey industrial applications of large radioactive sources, including well-logging sources;

(2) review current domestic and international Department, Department of Defense, State Department, and commercial programs to manage and dispose of radioactive sources;

(3) discuss disposal options and practices for currently deployed or future sources and, if deficiencies are noted in existing disposal options or practices for either deployed or future sources, recommend options to remedy deficiencies; and

(4) develop a program plan for research and development to develop alternatives to large industrial sources that reduce safety, environmental, or proliferation risks to either workers using the sources or the public.

(b) PROGRAM.—The Secretary shall establish a research and development program to implement the program plan developed under subsection (a)(4). The program shall include miniaturized particle accelerators for well-logging or other industrial applications and portable

accelerators for production of short-lived radioactive materials at an industrial site.

SEC. 930. GEOLOGICAL ISOLATION OF SPENT FUEL.

The Secretary shall conduct a study to determine the feasibility of deep borehole disposal of spent nuclear fuel and high-level radioactive waste. The study shall emphasize geological, chemical, and hydrological characterization of, and design of engineered structures for, deep borehole environments. Not later than 1 year after the date of enactment of this Act, the Secretary shall transmit the study to the Congress.

Subtitle E—Fossil Energy

PART I—RESEARCH PROGRAMS

SEC. 931. FOSSIL ENERGY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for fossil energy research, development, demonstration, and commercial application activities, including activities authorized under this part:

(1) For fiscal year 2004, $530,000,000.

(2) For fiscal year 2005, $556,000,000.

(3) For fiscal year 2006, $583,000,000.

(4) For fiscal year 2007, $611,000,000.

(5) For fiscal year 2008, $626,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) For activities under section 932(b)(2), $28,000,000 for each of the fiscal years 2004 through 2008.

(2) For activities under section 934—

(A) for fiscal year 2004, $12,000,000;

(B) for fiscal year 2005, $15,000,000; and

(C) for each of fiscal years 2006 through 2008, $20,000,000.

(3) For activities under section 935, to remain available until expended—

(A) for fiscal year 2004, $259,000,000;

(B) for fiscal year 2005, $272,000,000;

(C) for fiscal year 2006, $285,000,000;

(D) for fiscal year 2007, $298,000,000; and

(E) for fiscal year 2008, $308,000,000.

(4) For the Office of Arctic Energy under section 3197 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (42 U.S.C. 7144d), $25,000,000 for each of fiscal years 2004 through 2008.

(5) For activities under section 933, $4,000,000 for fiscal year 2004 and $2,000,000 for each of fiscal years 2005 through 2008.

(c) EXTENDED AUTHORIZATION.—There are authorized to be appropriated to the Secretary for the Office of Arctic Energy under section 3197 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (42 U.S.C. 7144d), $25,000,000 for each of fiscal years 2009 through 2012.

(d) LIMITS ON USE OF FUNDS.—(1) None of the funds authorized under this section may be used for Fossil Energy Environmental Restoration or Import/Export Authorization.

(2) Of the funds authorized under subsection (b)(2), not less than 20 percent of the funds appropriated for each fiscal year shall be dedicated to research and development carried out at institutions of higher education.

SEC. 932. OIL AND GAS RESEARCH PROGRAMS.

(a) OIL AND GAS RESEARCH.—The Secretary shall conduct a program of research, development, demonstration, and commercial application on oil and gas, including—

(1) exploration and production;

(2) gas hydrates;

(3) reservoir life and extension;

(4) transportation and distribution infrastructure;

(5) ultraclean fuels;

(6) heavy oil and oil shale; and

(7) related environmental research.

(b) FUEL CELLS.—(1) The Secretary shall conduct a program of research, development, demonstration, and commercial application on fuel cells for low-cost, high-efficiency, fuel-flexible, modular power systems.

(2) The demonstrations under paragraph (1) shall include fuel cell technology for commercial, residential, and transportation applications, and distributed generation systems, utilizing improved manufacturing production and processes.

(c) NATURAL GAS AND OIL DEPOSITS REPORT.—Not later than 2 years after the date of enactment of this Act, and every 2 years thereafter, the Secretary of the Interior, in consultation with other appropriate Federal agencies, shall transmit a report to the Congress of the latest estimates of natural gas and oil reserves, reserves growth, and undiscovered resources in Federal and State waters off the coast of Louisiana and Texas.

(d) INTEGRATED CLEAN POWER AND ENERGY RESEARCH.—(1) The Secretary shall establish a national center or consortium of excellence in clean energy and

power generation, utilizing the resources of the existing Clean Power and Energy Research Consortium, to address the Nation's critical dependence on energy and the need to reduce emissions.

(2) The center or consortium shall conduct a program of research, development, demonstration, and commercial application on integrating the following six focus areas:

(A) Efficiency and reliability of gas turbines for power generation.

(B) Reduction in emissions from power generation.

(C) Promotion of energy conservation issues.

(D) Effectively utilizing alternative fuels and renewable energy.

(E) Development of advanced materials technology for oil and gas exploration and utilization in harsh environments.

(F) Education on energy and power generation issues.

SEC. 933. TECHNOLOGY TRANSFER.

The Secretary shall establish a competitive program to award a contract to a nonprofit entity for the purpose of transferring technologies developed with public funds. The entity selected under this section shall have experience in offshore oil and gas technology research manage-

ment, in the transfer of technologies developed with public funds to the offshore and maritime industry, and in management of an offshore and maritime industry consortium. The entity selected under section 942 shall not be eligible for selection under this section. When appropriate, the Secretary shall consider utilizing the entity selected under this section when implementing the activities authorized by section 975.

SEC. 934. RESEARCH AND DEVELOPMENT FOR COAL MINING TECHNOLOGIES.

(a) ESTABLISHMENT.—The Secretary shall carry out a program of research and development on coal mining technologies. The Secretary shall cooperate with appropriate Federal agencies, coal producers, trade associations, equipment manufacturers, institutions of higher education with mining engineering departments, and other relevant entities.

(b) PROGRAM.—The research and development activities carried out under this section shall—

(1) be guided by the mining research and development priorities identified by the Mining Industry of the Future Program and in the recommendations from relevant reports of the National Academy of Sciences on mining technologies;

(2) include activities exploring minimization of contaminants in mined coal that contribute to environmental concerns including development and demonstration of electromagnetic wave imaging ahead of mining operations;

(3) develop and demonstrate coal bed electromagnetic wave imaging and radar techniques for horizontal drilling in order to increase methane recovery efficiency, prevent spoilage of domestic coal reserves, and minimize water disposal associated with methane extraction; and

(4) expand mining research capabilities at institutions of higher education.

SEC. 935. COAL AND RELATED TECHNOLOGIES PROGRAM.

(a) IN GENERAL.—In addition to the programs authorized under title IV, the Secretary shall conduct a program of technology research, development, demonstration, and commercial application for coal and power systems, including programs to facilitate production and generation of coal-based power through—

(1) innovations for existing plants;

(2) integrated gasification combined cycle;

(3) advanced combustion systems;

(4) turbines for synthesis gas derived from coal;

(5) carbon capture and sequestration research and development;

(6) coal-derived transportation fuels and chemicals;

(7) solid fuels and feedstocks;

(8) advanced coal-related research;

(9) advanced separation technologies; and

(10) a joint project for permeability enhancement in coals for natural gas production and carbon dioxide sequestration.

(b) COST AND PERFORMANCE GOALS.—In carrying out programs authorized by this section, the Secretary shall identify cost and performance goals for coal-based technologies that would permit the continued cost-competitive use of coal for electricity generation, as chemical feedstocks, and as transportation fuel in 2007, 2015, and the years after 2020. In establishing such cost and performance goals, the Secretary shall—

(1) consider activities and studies undertaken to date by industry in cooperation with the Department in support of such assessment;

(2) consult with interested entities, including coal producers, industries using coal, organizations to promote coal and advanced coal technologies, en-

vironmental organizations, and organizations representing workers;

(3) not later than 120 days after the date of enactment of this Act, publish in the Federal Register proposed draft cost and performance goals for public comments; and

(4) not later than 180 days after the date of enactment of this Act and every four years thereafter, submit to Congress a report describing final cost and performance goals for such technologies that includes a list of technical milestones as well as an explanation of how programs authorized in this section will not duplicate the activities authorized under the Clean Coal Power Initiative authorized under subtitle A of title IV.

SEC. 936. COMPLEX WELL TECHNOLOGY TESTING FACILITY.

The Secretary, in coordination with industry leaders in extended research drilling technology, shall establish a Complex Well Technology Testing Facility at the Rocky Mountain Oilfield Testing Center to increase the range of extended drilling technologies.

PART II—ULTRA-DEEPWATER AND UNCONVENTIONAL NATURAL GAS

SEC. 941. PROGRAM AUTHORITY.

(a) IN GENERAL.—The Secretary shall carry out a program under this part of research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas and other petroleum resource exploration and production, including safe operations and environmental mitigation (including reduction of greenhouse gas emissions and sequestration of carbon).

(b) PROGRAM ELEMENTS.—The program under this part shall address the following areas, including improving safety and minimizing environmental impacts of activities within each area:

(1) Ultra-deepwater technology.

(2) Ultra-deepwater architecture.

(3) Unconventional natural gas and other petroleum resource exploration and production technology.

(c) LIMITATION ON LOCATION OF FIELD ACTIVITIES.—Field activities under the program under this part shall be carried out only—

(1) in—

(A) areas in the territorial waters of the United States not under any Outer Continental Shelf moratorium as of September 30, 2002;

(B) areas onshore in the United States on public land administered by the Secretary of the Interior available for oil and gas leasing, where consistent with applicable law and land use plans; and

(C) areas onshore in the United States on State or private land, subject to applicable law; and

(2) with the approval of the appropriate Federal or State land management agency or private land owner.

(d) RESEARCH AT NATIONAL ENERGY TECHNOLOGY LABORATORY.—The Secretary, through the National Energy Technology Laboratory, shall carry out research complementary to research under subsection (b).

(e) CONSULTATION WITH SECRETARY OF THE INTERIOR.—In carrying out this part, the Secretary shall consult regularly with the Secretary of the Interior.

SEC. 942. ULTRA-DEEPWATER PROGRAM.

(a) IN GENERAL.—The Secretary shall carry out the activities under paragraphs (1) and (2) of section 941(b), to maximize the value of the ultra-deepwater natural gas

and other petroleum resources of the United States by increasing the supply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) ROLE OF THE SECRETARY.—The Secretary shall have ultimate responsibility for, and oversight of, all aspects of the program under this section.

(c) ROLE OF THE PROGRAM CONSORTIUM.—

(1) IN GENERAL.—The Secretary shall contract with a consortium to—

(A) manage awards pursuant to subsection (f)(4);

(B) make recommendations to the Secretary for project solicitations;

(C) disburse funds awarded under subsection (f) as directed by the Secretary in accordance with the annual plan under subsection (e); and

(D) carry out other activities assigned to the program consortium by this section.

(2) LIMITATION.—The Secretary may not assign any activities to the program consortium except as specifically authorized under this section.

(3) CONFLICT OF INTEREST.—(A) The Secretary shall establish procedures—

(i) to ensure that each board member, officer, or employee of the program consortium who is in a decisionmaking capacity under subsection (f)(3) or (4) shall disclose to the Secretary any financial interests in, or financial relationships with, applicants for or recipients of awards under this section, including those of his or her spouse or minor child, unless such relationships or interests would be considered to be remote or inconsequential; and

(ii) to require any board member, officer, or employee with a financial relationship or interest disclosed under clause (i) to recuse himself or herself from any review under subsection (f)(3) or oversight under subsection (f)(4) with respect to such applicant or recipient.

(B) The Secretary may disqualify an application or revoke an award under this section if a board member, officer, or employee has failed to comply with procedures required under subparagraph (A)(ii).

(d) SELECTION OF THE PROGRAM CONSORTIUM.—

(1) IN GENERAL.—The Secretary shall select the program consortium through an open, competitive process.

(2) MEMBERS.—The program consortium may include corporations, institutions of higher education, National Laboratories, or other research institutions. After submitting a proposal under paragraph (4), the program consortium may not add members without the consent of the Secretary.

(3) TAX STATUS.—The program consortium shall be an entity that is exempt from tax under section 501(c)(3) of the Internal Revenue Code of 1986.

(4) SCHEDULE.—Not later than 90 days after the date of enactment of this Act, the Secretary shall solicit proposals for the creation of the program consortium, which must be submitted not less than 180 days after the date of enactment of this Act. The Secretary shall select the program consortium not later than 240 days after such date of enactment.

(5) APPLICATION.—Applicants shall submit a proposal including such information as the Secretary may require. At a minimum, each proposal shall—

(A) list all members of the consortium;

(B) fully describe the structure of the consortium, including any provisions relating to intellectual property; and

(C) describe how the applicant would carry out the activities of the program consortium under this section.

(6) ELIGIBILITY.—To be eligible to be selected as the program consortium, an applicant must be an entity whose members collectively have demonstrated capabilities in planning and managing research, development, demonstration, and commercial application programs in natural gas or other petroleum exploration or production.

(7) CRITERION.—The Secretary may consider the amount of the fee an applicant proposes to receive under subsection (g) in selecting a consortium under this section.

(e) ANNUAL PLAN.—

(1) IN GENERAL.—The program under this section shall be carried out pursuant to an annual plan prepared by the Secretary in accordance with paragraph (2).

(2) DEVELOPMENT.—(A) Before drafting an annual plan under this subsection, the Secretary shall solicit specific written recommendations from

the program consortium for each element to be addressed in the plan, including those described in paragraph (4). The Secretary may request that the program consortium submit its recommendations in the form of a draft annual plan.

(B) The Secretary shall submit the recommendations of the program consortium under subparagraph (A) to the Ultra-Deepwater Advisory Committee established under section 945(a) for review, and such Advisory Committee shall provide to the Secretary written comments by a date determined by the Secretary. The Secretary may also solicit comments from any other experts.

(C) The Secretary shall consult regularly with the program consortium throughout the preparation of the annual plan.

(3) PUBLICATION.—The Secretary shall transmit to the Congress and publish in the Federal Register the annual plan, along with any written comments received under paragraph (2)(A) and (B). The annual plan shall be transmitted and published not later than 60 days after the date of enactment of an Act making appropriations for a fiscal year for the program under this section.

(4) CONTENTS.—The annual plan shall describe the ongoing and prospective activities of the program under this section and shall include—

(A) a list of any solicitations for awards that the Secretary plans to issue to carry out research, development, demonstration, or commercial application activities, including the topics for such work, who would be eligible to apply, selection criteria, and the duration of awards; and

(B) a description of the activities expected of the program consortium to carry out subsection (f)(4).

(f) AWARDS.—

(1) IN GENERAL.—The Secretary shall make awards to carry out research, development, demonstration, and commercial application activities under the program under this section. The program consortium shall not be eligible to receive such awards, but members of the program consortium may receive such awards.

(2) PROPOSALS.—The Secretary shall solicit proposals for awards under this subsection in such manner and at such time as the Secretary may prescribe, in consultation with the program consortium.

(3) REVIEW.—The Secretary shall make awards under this subsection through a competitive process, which shall include a review by individuals selected by the Secretary. Such individuals shall include, for each application, Federal officials, the program consortium, and non-Federal experts who are not board members, officers, or employees of the program consortium or of a member of the program consortium.

(4) OVERSIGHT.—(A) The program consortium shall oversee the implementation of awards under this subsection, consistent with the annual plan under subsection (e), including disbursing funds and monitoring activities carried out under such awards for compliance with the terms and conditions of the awards.

(B) Nothing in subparagraph (A) shall limit the authority or responsibility of the Secretary to oversee awards, or limit the authority of the Secretary to review or revoke awards.

(C) The Secretary shall provide to the program consortium the information necessary for the program consortium to carry out its responsibilities under this paragraph.

(g) FEE.—

(1) IN GENERAL.—To compensate the program consortium for carrying out its activities under this section, the Secretary shall provide to the program consortium a fee in an amount not to exceed 7.5 percent of the amounts awarded under subsection (f) for each fiscal year.

(2) ADVANCE.—The Secretary shall advance funds to the program consortium upon selection of the consortium, which shall be deducted from amounts to be provided under paragraph (1).

(h) AUDIT.—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided to the program consortium, and funds provided under awards made under subsection (f), have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

SEC. 943. UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES PROGRAM.

(a) IN GENERAL.—The Secretary shall carry out activities under section 941(b)(3), to maximize the value of the onshore unconventional natural gas and other petroleum resources of the United States by increasing the sup-

ply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) AWARDS.—

(1) IN GENERAL.—The Secretary shall carry out this section through awards made through an open, competitive process.

(2) CONSORTIA.—In carrying out paragraph (1), the Secretary shall give preference to making awards to consortia.

(c) AUDIT.—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided under awards made under this section have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

(d) FOCUS AREAS.—Awards under this section may focus on areas including advanced coal-bed methane, deep drilling, natural gas production from tight sands, natural gas production from gas shales, innovative exploration and production techniques, enhanced recovery techniques, and

environmental mitigation of unconventional natural gas and other petroleum resources exploration and production.

(e) ACTIVITIES BY THE UNITED STATES GEOLOGICAL SURVEY.—The Secretary of the Interior, through the United States Geological Survey, shall, where appropriate, carry out programs of long-term research to complement the programs under this section.

SEC. 944. ADDITIONAL REQUIREMENTS FOR AWARDS.

(a) DEMONSTRATION PROJECTS.—An application for an award under this part for a demonstration project shall describe with specificity the intended commercial use of the technology to be demonstrated.

(b) FLEXIBILITY IN LOCATING DEMONSTRATION PROJECTS.—Subject to the limitation in section 941(c), a demonstration project under this part relating to an ultra-deepwater technology or an ultra-deepwater architecture may be conducted in deepwater depths.

(c) INTELLECTUAL PROPERTY AGREEMENTS.—If an award under this part is made to a consortium (other than the program consortium), the consortium shall provide to the Secretary a signed contract agreed to by all members of the consortium describing the rights of each member to intellectual property used or developed under the award.

(d) TECHNOLOGY TRANSFER..—Each recipient of an award under this part shall conduct technology transfer

activities, as appropriate, and outreach activities pursuant to section 988.

(e) COST-SHARING REDUCTION FOR INDEPENDENT PRODUCERS.—In applying the cost-sharing requirements under section 972 to an award under this part made solely to an independent producer of oil or gas, the Secretary may reduce the applicable non-Federal requirement in such section to a level not less than 10 percent of the cost of the project.

SEC. 945. ADVISORY COMMITTEES.

(a) ULTRA-DEEPWATER ADVISORY COMMITTEE.—

(1) ESTABLISHMENT.—Not later than 270 days after the date of enactment of this Act, the Secretary shall establish an advisory committee to be known as the Ultra-Deepwater Advisory Committee.

(2) MEMBERSHIP.—The advisory committee under this subsection shall be composed of members appointed by the Secretary and including—

(A) individuals with extensive research experience or operational knowledge of offshore natural gas and other petroleum exploration and production;

(B) individuals broadly representative of the affected interests in ultra-deepwater natural gas and other petroleum production, including

interests in environmental protection and safe operations;

(C) no individuals who are Federal employee; and

(D) no individuals who are board members, officers, or employees of the program consortium.

(3) DUTIES.—The advisory committee under this subsection shall—

(A) advise the Secretary on the development and implementation of programs under this part related to ultra-deepwater natural gas and other petroleum resources; and

(B) carry out section 942(e)(2)(B).

(4) COMPENSATION.—A member of the advisory committee under this subsection shall serve without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(b) UNCONVENTIONAL RESOURCES TECHNOLOGY ADVISORY COMMITTEE.—

(1) ESTABLISHMENT.—Not later than 270 days after the date of enactment of this Act, the Sec-

retary shall establish an advisory committee to be known as the Unconventional Resources Technology Advisory Committee.

(2) MEMBERSHIP.—The advisory committee under this subsection shall be composed of members appointed by the Secretary, including—

(A) individuals with extensive research experience or operational knowledge of unconventional natural gas and other petroleum resource exploration and production, including independent oil and gas producers;

(B) individuals broadly representative of the affected interests in unconventional natural gas and other petroleum resource exploration and production, including interests in environmental protection and safe operations; and

(C) no individuals who are Federal employees.

(3) DUTIES.—The advisory committee under this subsection shall advise the Secretary on the development and implementation of activities under this part related to unconventional natural gas and other petroleum resources.

(4) COMPENSATION.—A member of the advisory committee under this subsection shall serve

without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(c) PROHIBITION.—No advisory committee established under this section shall make recommendations on funding awards to consortia or for specific projects.

SEC. 946. LIMITS ON PARTICIPATION.

(a) IN GENERAL.—An entity shall be eligible to receive an award under this part only if the Secretary finds—

(1) that the entity's participation in the program under this part would be in the economic interest of the United States; and

(2) that either—

(A) the entity is a United States-owned entity organized under the laws of the United States; or

(B) the entity is organized under the laws of the United States and has a parent entity organized under the laws of a country that affords—

(i) to United States-owned entities opportunities, comparable to those afforded

to any other entity, to participate in any cooperative research venture similar to those authorized under this part;

(ii) to United States-owned entities local investment opportunities comparable to those afforded to any other entity; and

(iii) adequate and effective protection for the intellectual property rights of United States-owned entities.

(b) SENSE OF CONGRESS AND REPORT.—It is the Sense of the Congress that ultra-deepwater technology developed under this part is to be developed primarily for production of ultra-deepwater natural gas and other petroleum resources of the United States, and that this priority is to be reflected in the terms of grants, contracts, and cooperative agreements entered under this part. As part of the annual Departmental budget submission, the Secretary shall report on all steps taken to implement the policy described in this subsection.

SEC. 947. SUNSET.

The authority provided by this part shall terminate on September 30, 2010.

SEC. 948. DEFINITIONS.

In this part:

(1) DEEPWATER.—The term ''deepwater'' means a water depth that is greater than 200 but less than 1,500 meters.

(2) INDEPENDENT PRODUCER OF OIL OR GAS.—

(A) IN GENERAL.—The term ''independent producer of oil or gas'' means any person who produces oil or gas other than a person to whom subsection (c) of section 613A of the Internal Revenue Code of 1986 does not apply by reason of paragraph (2) (relating to certain retailers) or paragraph (4) (relating to certain refiners) of section 613A(d) of such Code.

(B) RULES FOR APPLYING PARAGRAPHS (2) AND (4) OF SECTION 613A(d).—For purposes of subparagraph (A), paragraphs (2) and (4) of section 613A(d) of the Internal Revenue Code of 1986 shall be applied by substituting ''calendar year'' for ''taxable year'' each place it appears in such paragraphs.

(3) PROGRAM CONSORTIUM.—The term ''program consortium'' means the consortium selected under section 943(d).

(4) REMOTE OR INCONSEQUENTIAL.—The term ''remote or inconsequential'' has the meaning given

that term in regulations issued by the Office of Government Ethics under section 208(b)(2) of title 18, United States Code.

(5) ULTRA-DEEPWATER.—The term ''ultra-deepwater'' means a water depth that is equal to or greater than 1,500 meters.

(6) ULTRA-DEEPWATER ARCHITECTURE.—The term ''ultra-deepwater architecture'' means the integration of technologies for the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.

(7) ULTRA-DEEPWATER TECHNOLOGY.—The term ''ultra-deepwater technology'' means a discrete technology that is specially suited to address one or more challenges associated with the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.

(8) UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCE.— The term ''unconventional natural gas and other petroleum resource'' means natural gas and other petroleum resource located onshore in an economically inaccessible geological formation.

SEC. 949. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary such sums as may be necessary for fiscal years 2004 through 2010 to carry out the purposes of this part.

Subtitle F—Science

SEC. 951. SCIENCE.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for research, development, demonstration, and commercial application activities of the Office of Science, including activities authorized under this subtitle, including the amounts authorized under the amendment made by section 958(c)(2)(C), and including basic energy sciences, advanced scientific computing research, biological and environmental research, fusion energy sciences, high energy physics, nuclear physics, and research analysis and infrastructure support:

(1) For fiscal year 2004, $3,785,000,000.

(2) For fiscal year 2005, $4,153,000,000.

(3) For fiscal year 2006, $4,618,000,000.

(4) For fiscal year 2007, $5,310,000,000.

(5) For fiscal year 2008, $5,500,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) For activities of the Fusion Energy Sciences Program, including activities under section 953—

(A) for fiscal year 2004, $335,000,000;

(B) for fiscal year 2005, $349,000,000;

(C) for fiscal year 2006, $362,000,000;

(D) for fiscal year 2007, $377,000,000; and

(E) for fiscal year 2008, $393,000,000.

(2) For the Spallation Neutron Source—

(A) for construction in fiscal year 2004, $124,600,000;

(B) for construction in fiscal year 2005, $79,800,000;

(C) for completion of construction in fiscal year 2006, $41,100,000; and

(D) for other project costs (including research and development necessary to complete the project, preoperations costs, and capital equipment related to construction), $103,279,000 for the period encompassing fiscal years 2003 through 2006, to remain available until expended through September 30, 2006.

(3) For Catalysis Research activities under section 956—

(A) for fiscal year 2004, $33,000,000;

(B) for fiscal year 2005, $35,000,000;

(C) for fiscal year 2006, $36,500,000;

(D) for fiscal year 2007, $38,200,000; and

(E) for fiscal year 2008, $40,100,000.

(4) For Nanoscale Science and Engineering Research activities under section 957—

(A) for fiscal year 2004, $270,000,000;

(B) for fiscal year 2005, $292,000,000;

(C) for fiscal year 2006, $322,000,000;

(D) for fiscal year 2007, $355,000,000; and

(E) for fiscal year 2008, $390,000,000.

(5) For activities under section 957(c), from the amounts authorized under paragraph (4) of this subsection—

(A) for fiscal year 2004, $135,000,000;

(B) for fiscal year 2005, $150,000,000;

(C) for fiscal year 2006, $120,000,000;

(D) for fiscal year 2007, $100,000,000; and

(E) for fiscal year 2008, $125,000,000.

(6) For activities in the Genomes to Life Program under section 959—

(A) for fiscal year 2004, $100,000,000; and

(B) for fiscal years 2005 through 2008, such sums as may be necessary.

(7) For activities in the Energy-Water Supply Program under section 961, $30,000,000 for each of fiscal years 2004 through 2008.

(c) In addition to the funds authorized under subsection (b)(1), the following sums are authorized for construction costs associated with the ITER project under section 952:

(1) For fiscal year 2006, $55,000,000.

(2) For fiscal year 2007, $95,000,000.

(3) For fiscal year 2008, $115,000,000.

SEC. 952. UNITED STATES PARTICIPATION IN ITER.

(a) IN GENERAL.—The United States is authorized to participate in ITER in accordance with the provisions of this section.

(b) AGREEMENT.—(1) The Secretary is authorized to negotiate an agreement for United States participation in ITER.

(2) Any agreement for United States participation in ITER shall, at a minimum—

(A) clearly define the United States financial contribution to construction and operating costs;

(B) ensure that the share of ITER's high-technology components manufactured in the United States is at least proportionate to the United States financial contribution to ITER;

(C) ensure that the United States will not be financially responsible for cost overruns in components manufactured in other ITER participating countries;

(D) guarantee the United States full access to all data generated by ITER;

(E) enable United States researchers to propose and carry out an equitable share of the experiments at ITER;

(F) provide the United States with a role in all collective decisionmaking related to ITER; and

(G) describe the process for discontinuing or decommissioning ITER and any United States role in those processes.

(c) PLAN.—The Secretary, in consultation with the Fusion Energy Sciences Advisory Committee, shall develop a plan for the participation of United States scientists in ITER that shall include the United States research agenda for ITER, methods to evaluate whether ITER is promoting progress toward making fusion a reliable and affordable source of power, and a description of how work at ITER will relate to other elements of the United States fusion program. The Secretary shall request a review of the plan by the National Academy of Sciences.

(d) LIMITATION.—No funds shall be expended for the construction of ITER until the Secretary has transmitted to the Congress—

(1) the agreement negotiated pursuant to subsection (b) and 120 days have elapsed since that transmission;

(2) a report describing the management structure of ITER and providing a fixed dollar estimate of the cost of United States participation in the construction of ITER, and 120 days have elapsed since that transmission;

(3) a report describing how United States participation in ITER will be funded without reducing funding for other programs in the Office of Science, including other fusion programs, and 60 days have elapsed since that transmission; and

(4) the plan required by subsection (c) (but not the National Academy of Sciences review of that plan), and 60 days have elapsed since that transmission.

(e) ALTERNATIVE TO ITER.—If at any time during the negotiations on ITER, the Secretary determines that construction and operation of ITER is unlikely or infeasible, the Secretary shall send to Congress, as part of the budget request for the following year, a plan for imple-

menting the domestic burning plasma experiment known as FIRE, including costs and schedules for such a plan. The Secretary shall refine such plan in full consultation with the Fusion Energy Sciences Advisory Committee and shall also transmit such plan to the National Academy of Sciences for review.

(f) DEFINITIONS.—In this section—

(1) the term ''construction'' means the physical construction of the ITER facility, and the physical construction, purchase, or manufacture of equipment or components that are specifically designed for the ITER facility, but does not mean the design of the facility, equipment, or components;

(2) the term ''FIRE'' means the Fusion Ignition Research Experiment, the fusion research experiment for which design work has been supported by the Department as a possible alternative burning plasma experiment in the event that ITER fails to move forward; and

(3) the term ''ITER'' means the international burning plasma fusion research project in which the President announced United States participation on January 30, 2003.

SEC. 953. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.

(a) DECLARATION OF POLICY.—It shall be the policy of the United States to conduct research, development, demonstration, and commercial application to provide for the scientific, engineering, and commercial infrastructure necessary to ensure that the United States is competitive with other nations in providing fusion energy for its own needs and the needs of other nations, including by demonstrating electric power or hydrogen production for the United States energy grid utilizing fusion energy at the earliest date possible.

(b) PLANNING.—(1) Not later than 180 days after the date of enactment of this Act, the Secretary shall present to Congress a plan, with proposed cost estimates, budgets, and potential international partners, for the implementation of the policy described in subsection (a). The plan shall ensure that—

(A) existing fusion research facilities are more fully utilized;

(B) fusion science, technology, theory, advanced computation, modeling, and simulation are strengthened;

(C) new magnetic and inertial fusion research facilities are selected based on scientific innovation, cost effectiveness, and their potential to advance the goal of practical fusion energy at the earliest date

possible, and those that are selected are funded at a cost-effective rate;

(D) communication of scientific results and methods between the fusion energy science community and the broader scientific and technology communities is improved;

(E) inertial confinement fusion facilities are utilized to the extent practicable for the purpose of inertial fusion energy research and development; and

(F) attractive alternative inertial and magnetic fusion energy approaches are more fully explored.

(2) Such plan shall also address the status of and, to the degree possible, costs and schedules for—

(A) in coordination with the program in section 960, the design and implementation of international or national facilities for the testing of fusion materials; and

(B) the design and implementation of international or national facilities for the testing and development of key fusion technologies.

SEC. 954. SPALLATION NEUTRON SOURCE.

(a) DEFINITION.—For the purposes of this section, the term ''Spallation Neutron Source'' means Department Project 99–E–334, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

(b) REPORT.—The Secretary shall report on the Spallation Neutron Source as part of the Department's annual budget submission, including a description of the achievement of milestones, a comparison of actual costs to estimated costs, and any changes in estimated project costs or schedule.

(c) LIMITATIONS.—The total amount obligated by the Department, including prior year appropriations, for the Spallation Neutron Source may not exceed—

(1) $1,192,700,000 for costs of construction;

(2) $219,000,000 for other project costs; and

(3) $1,411,700,000 for total project cost.

SEC. 955. SUPPORT FOR SCIENCE AND ENERGY FACILITIES AND INFRASTRUCTURE.

(a) FACILITY AND INFRASTRUCTURE POLICY.—The Secretary shall develop and implement a strategy for facilities and infrastructure supported primarily from the Office of Science, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, or the Office of Nuclear Energy, Science, and Technology Programs at all National Laboratories and single-purpose research facilities. Such strategy shall provide cost-effective means for—

(1) maintaining existing facilities and infrastructure, as needed;

(2) closing unneeded facilities;

(3) making facility modifications; and

(4) building new facilities.

(b) REPORT.—(1) The Secretary shall prepare and transmit, along with the President's budget request to the Congress for fiscal year 2006, a report containing the strategy developed under subsection (a).

(2) For each National Laboratory and single-purpose research facility, for the facilities primarily used for science and energy research, such report shall contain—

(A) the current priority list of proposed facilities and infrastructure projects, including cost and schedule requirements;

(B) a current ten-year plan that demonstrates the reconfiguration of its facilities and infrastructure to meet its missions and to address its long-term operational costs and return on investment;

(C) the total current budget for all facilities and infrastructure funding; and

(D) the current status of each facility and infrastructure project compared to the original baseline cost, schedule, and scope.

SEC. 956. CATALYSIS RESEARCH PROGRAM.

(a) ESTABLISHMENT.—The Secretary, through the Office of Science, shall support a program of research and

development in catalysis science consistent with the Department's statutory authorities related to research and development. The program shall include efforts to—

(1) enable catalyst design using combinations of experimental and mechanistic methodologies coupled with computational modeling of catalytic reactions at the molecular level;

(2) develop techniques for high throughput synthesis, assay, and characterization at nanometer and subnanometer scales in situ under actual operating conditions,

(3) synthesize catalysts with specific site architectures;

(4) conduct research on the use of precious metals for catalysis; and

(5) translate molecular understanding to the design of catalytic compounds.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Director of the Office of Science shall—

(1) support both individual investigators and multidisciplinary teams of investigators to pioneer new approaches in catalytic design;

(2) develop, plan, construct, acquire, share, or operate special equipment or facilities for the use of

investigators in collaboration with national user facilities such as nanoscience and engineering centers;

(3) support technology transfer activities to benefit industry and other users of catalysis science and engineering; and

(4) coordinate research and development activities with industry and other Federal agencies.

(c) TRIENNIAL ASSESSMENT.—The National Academy of Sciences shall review the catalysis program every three years to report on gains made in the fundamental science of catalysis and its progress towards developing new fuels for energy production and material fabrication processes.

SEC. 957. NANOSCALE SCIENCE AND ENGINEERING RESEARCH.

(a) ESTABLISHMENT.—The Secretary, acting through the Office of Science, shall support a program of research, development, demonstration, and commercial application in nanoscience and nanoengineering. The program shall include efforts to further the understanding of the chemistry, physics, materials science, and engineering of phenomena on the scale of nanometers and to apply that knowledge to the Department's mission areas.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Office of Science shall—

(1) support both individual investigators and teams of investigators, including multidisciplinary teams;

(2) carry out activities under subsection (c);

(3) support technology transfer activities to benefit industry and other users of nanoscience and nanoengineering;

(4) coordinate research and development activities with other Department programs, industry, and other Federal agencies;

(5) ensure that societal and ethical concerns will be addressed as the technology is developed by—

(A) establishing a research program to identify societal and ethical concerns related to nanotechnology, and ensuring that the results of such research are widely disseminated; and

(B) integrating, insofar as possible, research on societal and ethical concerns with nanotechnology research and development; and

(6) ensure that the potential of nanotechnology to produce or facilitate the production of clean, inexpensive energy is realized by supporting

nanotechnology energy applications research and development.

(c) NANOSCIENCE AND NANOENGINEERING RESEARCH CENTERS AND MAJOR INSTRUMENTATION.—(1) The Secretary shall carry out projects to develop, plan, construct, acquire, operate, or support special equipment, instrumentation, or facilities for investigators conducting research and development in nanoscience and nanoengineering.

(2) Projects under paragraph (1) may include the measurement of properties at the scale of nanometers, manipulation at such scales, and the integration of technologies based on nanoscience or nanoengineering into bulk materials or other technologies.

(3) Facilities under paragraph (1) may include electron microcharacterization facilities, microlithography facilities, scanning probe facilities, and related instrumentation.

(4) The Secretary shall encourage collaborations among Department programs, institutions of higher education, laboratories, and industry at facilities under this subsection.

SEC. 958. ADVANCED SCIENTIFIC COMPUTING FOR ENERGY MISSIONS.

(a) IN GENERAL.—The Secretary, acting through the Office of Science, shall support a program to advance the Nation's computing capability across a diverse set of grand challenge, computationally based, science problems related to departmental missions.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Office of Science shall—

(1) advance basic science through computation by developing software to solve grand challenge science problems on new generations of computing platforms in collaboration with other Department program offices;

(2) enhance the foundations for scientific computing by developing the basic mathematical and computing systems software needed to take full advantage of the computing capabilities of computers with peak speeds of 100 teraflops or more, some of which may be unique to the scientific problem of interest;

(3) enhance national collaboratory and networking capabilities by developing software to integrate geographically separated researchers into ef-

fective research teams and to facilitate access to and movement and analysis of large (petabyte) data sets;

(4) develop and maintain a robust scientific computing hardware infrastructure to ensure that the computing resources needed to address departmental missions are available; and

(5) explore new computing approaches and technologies that promise to advance scientific computing, including developments in quantum computing.

(c) HIGH-PERFORMANCE COMPUTING ACT OF 1991 AMENDMENTS.—The High-Performance Computing Act of 1991 is amended—

(1) in section 4 (15 U.S.C. 5503)—

(A) in paragraph (3) by striking ''means'' and inserting ''and networking and information technology mean'', and by striking ''(including vector supercomputers and large scale parallel systems)''; and

(B) in paragraph (4), by striking ''packet switched''; and

(2) in section 203 (15 U.S.C. 5523)—

(A) in subsection (a), by striking all after ''As part of the'' and inserting ''Networking and Information Technology Research and De-

velopment Program, the Secretary of Energy shall conduct basic and applied research in networking and information technology, with emphasis on supporting fundamental research in the physical sciences and engineering, and energy applications; providing supercomputer access and advanced communication capabilities and facilities to scientific researchers; and developing tools for distributed scientific collaboration.'';

(B) in subsection (b), by striking ''Program'' and inserting ''Networking and Information Technology Research and Development Program''; and

(C) by amending subsection (e) to read as follows:

''(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy to carry out the Networking and Information Technology Research and Development Program such sums as may be necessary for fiscal years 2004 through 2008.''.

(d) COORDINATION.—The Secretary shall ensure that the program under this section is integrated and consistent with—

(1) the Accelerated Strategic Computing Initiative of the National Nuclear Security Administration; and

(2) other national efforts related to advanced scientific computing for science and engineering.

(e) REPORT.—(1) Before undertaking any new initiative to develop new advanced architecture for high-speed computing, the Secretary, through the Director of the Office of Science, shall transmit a report to the Congress describing—

(A) the expected duration and cost of the initiative;

(B) the technical milestones the initiative is designed to achieve;

(C) how institutions of higher education and private firms will participate in the initiative; and

(D) why the goals of the initiative could not be achieved through existing programs.

(2) No funds may be expended on any initiative described in paragraph (1) until 30 days after the report required by that paragraph is transmitted to the Congress.

SEC. 959. GENOMES TO LIFE PROGRAM.

(a) PROGRAM.—

(1) ESTABLISHMENT.—The Secretary shall establish a research, development, and demonstration

program in genetics, protein science, and computational biology to support the energy, national security, and environmental mission of the Department.

(2) GRANTS.—The program shall support individual investigators and multidisciplinary teams of investigators through competitive, merit-reviewed grants.

(3) CONSULTATION.—In carrying out the program, the Secretary shall consult with other Federal agencies that conduct genetic and protein research.

(b) GOALS.—The program shall have the goal of developing technologies and methods based on the biological functions of genomes, microbes, and plants that—

(1) can facilitate the production of fuels, including hydrogen;

(2) convert carbon dioxide to organic carbon;

(3) improve national security and combat terrorism;

(4) detoxify soils and water at Department facilities contaminated with heavy metals and radiological materials; and

(5) address other Department missions as identified by the Secretary.

(c) PLAN.—

(1) DEVELOPMENT OF PLAN.—Not later than 1 year after the date of enactment of this Act, the Secretary shall prepare and transmit to the Congress a research plan describing how the program authorized pursuant to this section will be undertaken to accomplish the Program goals established in subsection (b).

(2) REVIEW OF PLAN.—The Secretary shall contract with the National Academy of Sciences to review the research plan developed under this subsection. The Secretary shall transmit the review to the Congress not later than 18 months after transmittal of the research plan under paragraph (1), along with the Secretary's response to the recommendations contained in the review.

(d) GENOMES TO LIFE USER FACILITIES AND ANCILLARY EQUIPMENT.—(1) Within the funds authorized to be appropriated pursuant to this Act, the amounts specified under section 951(b)(6) shall, subject to appropriations, be available for projects to develop, plan, construct, acquire, or operate special equipment, instrumentation, or facilities for investigators conducting research, development, demonstration, and commercial application in systems biology and proteomics and associated biological disciplines.

(2) Facilities under paragraph (1) may include facilities, equipment, or instrumentation for—

(A) the production and characterization of proteins;

(B) whole proteome analysis;

(C) characterization and imaging of molecular machines; and

(D) analysis and modeling of cellular systems.

(3) The Secretary shall encourage collaborations among universities, laboratories, and industry at facilities under this subsection. All facilities under this subsection shall have a specific mission of technology transfer to other institutions.

(e) PROHIBITION ON BIOMEDICAL AND HUMAN CELL AND HUMAN SUBJECT RESEARCH.—(1) In carrying out the program under this section, the Secretary shall not conduct biomedical research.

(2) Nothing in this section shall authorize the Secretary to conduct any research or demonstrations—

(A) on human cells or human subjects; or

(B) designed to have direct application with respect to human cells or human subjects.

SEC. 960. FISSION AND FUSION ENERGY MATERIALS RESEARCH PROGRAM.

In the President's fiscal year 2006 budget request, the Secretary shall establish a research and development program on material science issues presented by advanced fission reactors and the Department's fusion energy program. The program shall develop a catalog of material properties required for these applications, develop theoretical models for materials possessing the required properties, benchmark models against existing data, and develop a roadmap to guide further research and development in this area.

SEC. 961. ENERGY-WATER SUPPLY PROGRAM.

(a) ESTABLISHMENT.—There is established within the Department the Energy-Water Supply Program, to study energy-related and certain other issues associated with the supply of drinking water and operation of community water systems and to study water supply issues related to energy.

(b) DEFINITIONS.—For the purposes of this section:

(1) The term ''Foundation'' means the American Water Works Association Research Foundation.

(2) The term ''Indian tribe'' has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(3) The term ''Program'' means the Energy-Water Supply Program established by this section.

(4) The term ''Administrator'' means the Administrator of the Environmental Protection Agency.

(5) The term ''Agency'' means the Environmental Protection Agency.

(c) PROGRAM AREAS.—The Program shall develop methods, means, procedures, equipment, and improved technologies relating to—

(1) the arsenic removal program under subsection (d);

(2) the desalination program under subsection (e); and

(3) the water and energy sustainability program under subsection (f).

(d) ARSENIC REMOVAL PROGRAM.—(1) As soon as practicable after the date of enactment of this Act, the Secretary, in coordination with the Administrator and in partnership with the Foundation, shall utilize the facilities, institutions, and relationships established in the Consolidated Appropriations Resolution, 2003 as described in Senate Report 107–220 to carry out a research program to provide innovative methods and means for removal of arsenic.

(2) The program shall, to the maximum extent practicable, evaluate the means of—

(A) reducing energy costs incurred in using arsenic removal technologies;

(B) minimizing materials, operating, and maintenance costs; and

(C) minimizing any quantities of waste (especially hazardous waste) that result from use of arsenic removal technologies.

(3) Where applicable and reasonably available, projects undertaken under this subsection shall be peer-reviewed.

(4) In carrying out the program under this subsection, the Secretary, in coordination with the Administrator, shall—

(A) select projects involving a geographically and hydrologically diverse group of community water systems (as defined in section 1003 of the Public Health Service Act (42 U.S.C. 300)) and water chemistries, that have experienced technical or economic difficulties in providing drinking water with levels of arsenic at 10 parts-per-billion or lower, which projects shall be designed to develop innovative methods and means to deliver drinking water

that contains less than 10 parts per billion of arsenic; and

(B) provide not less than 40 percent of all funds spent pursuant to this subsection to address the needs of, and in collaboration with, rural communities or Indian tribes.

(5) The Foundation shall create methods for determining cost effectiveness of arsenic removal technologies used in the program.

(6) The Foundation shall include education, training, and technology transfer as part of the program.

(7) The Secretary shall consult with the Administrator to ensure that all activities conducted under the program are coordinated with the Agency and do not duplicate other programs in the Agency and other Federal agencies, State programs, and academia.

(8) Not later than 1 year after the date of commencement of the program under this subsection, and once every year thereafter, the Secretary shall submit to the Committee on Energy and Commerce of the House of Representatives and the Committee on Environment and Public Works and the Committee on Energy and Natural Resources of the Senate a report on the results of the program under this subsection.

(e) DESALINATION PROGRAM.—(1) The Secretary, in cooperation with the Commissioner of Reclamation of the Department of the Interior, shall carry out a program to conduct research and develop methods and means for desalination in accordance with the desalination technology progress plan developed under title II of the Energy and Water Development Appropriations Act, 2002 (115 Stat. 498), and described in Senate Report 107–39 under the heading ''WATER AND RELATED RESOURCES'' in the ''BUREAU OF RECLAMATION'' section.

(2) The desalination program shall—

(A) use the resources of the Department and the Department of the Interior that were involved in the development of the 2003 National Desalination and Water Purification Technology Roadmap for next-generation desalination technology;

(B) focus on technologies that are appropriate for use in desalinating brackish groundwater, drinking water, wastewater and other saline water supplies, or disposal of residual brine or salt; and

(C) consider the use of renewable energy sources.

(3) Funds made available to carry out this subsection may be used for construction projects, including completion of the National Desalination Research Center for

brackish groundwater and ongoing operational costs of this facility.

(4) The Secretary and the Commissioner of Reclamation of the Department of the Interior shall jointly establish a steering committee for activities conducted under this subsection. The steering committee shall be jointly chaired by 1 representative from the Program and 1 representative from the Bureau of Reclamation.

(f) WATER AND ENERGY SUSTAINABILITY PROGRAM.—(1) The Secretary shall develop a program to identify methods, means, procedures, equipment, and improved technologies necessary to ensure that sufficient quantities of water are available to meet energy needs and sufficient energy is available to meet water needs.

(2) In order to acquire information and avoid duplication, the Secretary shall work in collaboration with the Secretary of the Interior, Army Corps of Engineers, the Administrator, the Secretary of Commerce, the Secretary of Defense, relevant State agencies, nongovernmental organizations, and academia, to assess—

(A) future water resources needed to support energy development and production within the United States including water used for hydropower, and production of, or electricity generation by, hydrogen, biomass, fossil fuels, and nuclear fuel;

(B) future energy resources needed to support water purification and wastewater treatment, including desalination and water conveyance;

(C) use of impaired and nontraditional water supplies for energy production other than oil and gas extraction;

(D) technology and programs for improving water use efficiency in energy development and production; and

(E) technologies to reduce water use in energy development and production.

(3) The Secretary shall—

(A) develop a program plan and technology development roadmap for the Energy and Water Sustainability Program to identify scientific and technical requirements and activities that are required to support planning for energy sustainability under current and potential future conditions of water availability, use of impaired water for energy production and other uses, and reduction of water use in energy development and production;

(B) develop tools for national and local energy and water sustainability planning, including numerical models, decision analysis tools, economic anal-

ysis tools, databases, and planning methodologies and strategies;

(C) implement at least three 3 planning projects involving energy development or production that use the tools described in subparagraph (B) and assess the viability of those tools at the scale of river basins with at least one demonstration involving an international border; and

(D) transfer those tools to other Federal agencies, State agencies, nonprofit organizations, industry, and academia.

(4) Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to the Congress a report on the Water and Energy Sustainability Program that—

(A) includes the results of the assessment under paragraph (2) and the program plan and technology development roadmap;

(B) identifies policy, legal, and institutional issues related to water and energy sustainability; and

(C) makes recommendations for a management structure that optimizes use of Federal resources and programs.

SEC. 962. NITROGEN FIXATION.

The Secretary, acting through the Office of Science, shall support a program of research, development, demonstration, and commercial application on biological nitrogen fixation, including plant genomics research relevant to the development of commercial crop varieties with enhanced nitrogen fixation efficiency and ability.

Subtitle G—Energy and Environment

SEC. 964. UNITED STATES-MEXICO ENERGY TECHNOLOGY COOPERATION.

(a) PROGRAM.—The Secretary shall establish a research, development, demonstration, and commercial application program to be carried out in collaboration with entities in Mexico and the United States to promote energy efficient, environmentally sound economic development along the United States-Mexico border that minimizes public health risks from industrial activities in the border region.

(b) PROGRAM MANAGEMENT.—The program under subsection (a) shall be managed by the Department of Energy Carlsbad Environmental Management Field Office.

(c) TECHNOLOGY TRANSFER.—In carrying out projects and activities under this section, the Secretary shall assess the applicability of technology developed under

the Environmental Management Science Program of the Department.

(d) INTELLECTUAL PROPERTY.—In carrying out this section, he Secretary shall comply with the requirements of any agreement entered into between the United States and Mexico regarding intellectual property protection.

(e) AUTHORIZATION OF APPROPRIATIONS.—The following sums are authorized to be appropriated to the Secretary to carry out activities under this section:

(1) For each of fiscal years 2004 and 2005, $5,000,000.

(2) For each of fiscal years 2006, 2007, and 2008, $6,000,000.

SEC. 965. WESTERN HEMISPHERE ENERGY COOPERATION.

(a) PROGRAM.—The Secretary shall carry out a program to promote cooperation on energy issues with Western Hemisphere countries.

(b) ACTIVITIES.—Under the program, the Secretary shall fund activities to work with Western Hemisphere countries to—

(1) assist the countries in formulating and adopting changes in economic policies and other policies to—

(A) increase the production of energy supplies; and

(B) improve energy efficiency; and

(2) assist in the development and transfer of energy supply and efficiency technologies that would have a beneficial impact on world energy markets.

(c) UNIVERSITY PARTICIPATION.—To the extent practicable, the Secretary shall carry out the program under this section with the participation of universities so as to take advantage of the acceptance of universities by Western Hemisphere countries as sources of unbiased technical and policy expertise when assisting the Secretary in—

(1) evaluating new technologies;

(2) resolving technical issues;

(3) working with those countries in the development of new policies; and

(4) training policymakers, particularly in the case of universities that involve the participation of minority students, such as Hispanic-serving institutions and Historically Black Colleges and Universities.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

(1) $8,000,000 for fiscal year 2004;

(2) $10,000,000 for fiscal year 2005;

(3) $13,000,000 for fiscal year 2006;

(4) $16,000,000 for fiscal year 2007; and

(5) $19,000,000 for fiscal year 2008.

SEC. 966. WASTE REDUCTION AND USE OF ALTERNATIVES.

(a) GRANT AUTHORITY.—The Secretary is authorized to make a single grant to a qualified institution to examine and develop the feasibility of burning post-consumer carpet in cement kilns as an alternative energy source. The purposes of the grant shall include determining—

(1) how post-consumer carpet can be burned without disrupting kiln operations;

(2) the extent to which overall kiln emissions may be reduced;

(3) the emissions of air pollutants and other relevant environmental impacts; and

(4) how this process provides benefits to both cement kiln operations and carpet suppliers.

(b) QUALIFIED INSTITUTION.—For the purposes of subsection (a), a qualified institution is a research-intensive institution of higher education with demonstrated expertise in the fields of fiber recycling and logistical modeling of carpet waste collection and preparation.

SEC. 967. REPORT ON FUEL CELL TEST CENTER.

(a) STUDY.—Not later than 1 year after the date of enactment of this Act, the Secretary shall transmit to the Congress a report on the results of a study of the establishment of a test center for next-generation fuel cells at an institution of higher education that has available a continuous source of hydrogen and access to the electric transmission grid. Such report shall include a conceptual design for such test center and a projection of the costs of establishing the test center.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $500,000.

Subtitle H—Management

SEC. 971. AVAILABILITY OF FUNDS.

Funds authorized to be appropriated to the Department under this title shall remain available until expended.

SEC. 972. COST SHARING.

(a) RESEARCH AND DEVELOPMENT.—Except as otherwise provided in this title, for research and development programs carried out under this title the Secretary shall require a commitment from non-Federal sources of at least 20 percent of the cost of the project. The Secretary may reduce or eliminate the non-Federal requirement under this subsection if the Secretary determines that the

research and development is of a basic or fundamental nature.

(b) DEMONSTRATION AND COMMERCIAL APPLICATION.—Except as otherwise provided in this title, the Secretary shall require at least 50 percent of the costs directly and specifically related to any demonstration or commercial application project under this title to be provided from non-Federal sources. The Secretary may reduce the non-Federal requirement under this subsection if the Secretary determines that the reduction is necessary and appropriate considering the technological risks involved in the project and is necessary to meet the objectives of this title.

(c) CALCULATION OF AMOUNT.—In calculating the amount of the non-Federal commitment under subsection (a) or (b), the Secretary may include personnel, services, equipment, and other resources.

SEC. 973. MERIT REVIEW OF PROPOSALS.

Awards of funds authorized under this title shall be made only after an impartial review of the scientific and technical merit of the proposals for such awards has been carried out by or for the Department.

SEC. 974. EXTERNAL TECHNICAL REVIEW OF DEPARTMENTAL PROGRAMS.

(a) NATIONAL ENERGY RESEARCH AND DEVELOPMENT ADVISORY BOARDS.—(1) The Secretary shall estab-

lish one or more advisory boards to review Department research, development, demonstration, and commercial application programs in energy efficiency, renewable energy, nuclear energy, and fossil energy.

(2) The Secretary may designate an existing advisory board within the Department to fulfill the responsibilities of an advisory board under this subsection, and may enter into appropriate arrangements with the National Academy of Sciences to establish such an advisory board.

(b) UTILIZATION OF EXISTING COMMITTEES.—The Secretary shall continue to use the scientific program advisory committees chartered under the Federal Advisory Committee Act (5 U.S.C. App.) by the Office of Science to oversee research and development programs under that Office.

(c) MEMBERSHIP.— Each advisory board under this section shall consist of persons with appropriate expertise representing a diverse range of interests.

(d) MEETINGS AND PURPOSES.—Each advisory board under this section shall meet at least semiannually to review and advise on the progress made by the respective research, development, demonstration, and commercial application program or programs. The advisory board shall also review the measurable cost and performance-

based goals for such programs as established under section 901(b), and the progress on meeting such goals.

(e) PERIODIC REVIEWS AND ASSESSMENTS.—The Secretary shall enter into appropriate arrangements with the National Academy of Sciences to conduct periodic reviews and assessments of the programs authorized by this title, the measurable cost and performance-based goals for such programs as established under section 901(b), if any, and the progress on meeting such goals. Such reviews and assessments shall be conducted every 5 years, or more often as the Secretary considers necessary, and the Secretary shall transmit to the Congress reports containing the results of all such reviews and assessments.

SEC. 975. IMPROVED COORDINATION OF TECHNOLOGY TRANSFER ACTIVITIES.

(a) TECHNOLOGY TRANSFER COORDINATOR.—The Secretary shall designate a Technology Transfer Coordinator to perform oversight of and policy development for technology transfer activities at the Department. The Technology Transfer Coordinator shall coordinate the activities of the Technology Transfer Working Group, shall oversee the expenditure of funds allocated to the Technology Transfer Working Group, and shall coordinate with each technology partnership ombudsman appointed under

section 11 of the Technology Transfer Commercialization Act of 2000 (42 U.S.C. 7261c).

(b) TECHNOLOGY TRANSFER WORKING GROUP.—The Secretary shall establish a Technology Transfer Working Group, which shall consist of representatives of the National Laboratories and single-purpose research facilities, to—

(1) coordinate technology transfer activities occurring at National Laboratories and single-purpose research facilities;

(2) exchange information about technology transfer practices, including alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters; and

(3) develop and disseminate to the public and prospective technology partners information about opportunities and procedures for technology transfer with the Department, including those related to alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters.

(c) TECHNOLOGY TRANSFER RESPONSIBILITY.—Nothing in this section shall affect the technology transfer responsibilities of Federal employees under the Stevenson-

Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.).

SEC. 976. UNIVERSITY COLLABORATION.

Not later than 2 years after the date of enactment of this Act, the Secretary shall transmit to the Congress a report that examines the feasibility of promoting collaborations between large institutions of higher education and small institutions of higher education through grants, contracts, and cooperative agreements made by the Secretary for energy projects. The Secretary shall also consider providing incentives for the inclusion of small institutions of higher education, including minority-serving institutions, in energy research grants, contracts, and cooperative agreements.

SEC. 977. FEDERAL LABORATORY EDUCATIONAL PARTNERS.

(a) DISTRIBUTION OF ROYALTIES RECEIVED BY FEDERAL AGENCIES.—Section 14(a)(1)(B)(v) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c(a)(1)(B)(v)), is amended to read as follows:

> ''(v) for scientific research and development and for educational assistance and other purposes consistent with the missions and objectives of the agency and the laboratory.''.

(b) COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.—Section 12(b)(5)(C) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a(b)(5)(C)) is amended to read as follows:

"(C) for scientific research and development and for educational assistance consistent with the missions and objectives of the agency and the laboratory.".

SEC. 978. INTERAGENCY COOPERATION.

The Secretary shall enter into discussions with the Administrator of the National Aeronautics and Space Administration with the goal of reaching an interagency working agreement between the 2 agencies that would make the National Aeronautics and Space Administration's expertise in energy, gained from its existing and planned programs, more readily available to the relevant research, development, demonstration, and commercial applications programs of the Department. Technologies to be discussed should include the National Aeronautics and Space Administration's modeling, research, development, testing, and evaluation of new energy technologies, including solar, wind, fuel cells, and hydrogen storage and distribution.

SEC. 979. TECHNOLOGY INFRASTRUCTURE PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a Technology Infrastructure Program in accordance with this section.

(b) PURPOSE.—The purpose of the Technology Infrastructure Program shall be to improve the ability of National Laboratories and single-purpose research facilities to support departmental missions by—

(1) stimulating the development of technology clusters that can support departmental missions at the National Laboratories or single-purpose research facilities;

(2) improving the ability of National Laboratories and single-purpose research facilities to leverage and benefit from commercial research, technology, products, processes, and services; and

(3) encouraging the exchange of scientific and technological expertise between National Laboratories or single-purpose research facilities and entities that can support departmental missions at the National Laboratories or single-purpose research facilities, such as institutions of higher education; technology-related business concerns; nonprofit institutions; and agencies of State, tribal, or local governments.

(c) PROJECTS.—The Secretary shall authorize the Director of each National Laboratory or single-purpose research facility to implement the Technology Infrastructure Program at such National Laboratory or facility through projects that meet the requirements of subsections (d) and (e).

(d) PROGRAM REQUIREMENTS.—Each project funded under this section shall meet the following requirements:

(1) Each project shall include at least one of each of the following entities: a business; an institution of higher education; a nonprofit institution; and an agency of a State, local, or tribal government.

(2) Not less than 50 percent of the costs of each project funded under this section shall be provided from non-Federal sources. The calculation of costs paid by the non-Federal sources to a project shall include cash, personnel, services, equipment, and other resources expended on the project after start of the project. Independent research and development expenses of Government contractors that qualify for reimbursement under section 31.205–18(e) of the Federal Acquisition Regulation issued pursuant to section 25(c)(1) of the Office of Federal Procurement Policy Act (41 U.S.C. 421(c)(1)) may be credited toward costs paid by non-Federal sources

to a project, if the expenses meet the other requirements of this section.

(3) All projects under this section shall be competitively selected using procedures determined by the Secretary.

(4) Any participant that receives funds under this section may use generally accepted accounting principles for maintaining accounts, books, and records relating to the project.

(5) No Federal funds shall be made available under this section for construction or any project for more than 5 years.

(e) SELECTION CRITERIA.—(1) The Secretary shall allocate funds under this section only if the Director of the National Laboratory or single-purpose research facility managing the project determines that the project is likely to improve the ability of the National Laboratory or single-purpose research facility to achieve technical success in meeting departmental missions.

(2) The Secretary shall consider the following criteria in selecting a project to receive Federal funds:

(A) The potential of the project to promote the development of a commercially sustainable technology cluster following the period of Department investment, which will derive most of the demand for

its products or services from the private sector, and which will support departmental missions at the participating National Laboratory or single-purpose research facility.

(B) The potential of the project to promote the use of commercial research, technology, products, processes, and services by the participating National Laboratory or single-purpose research facility to achieve its mission or the commercial development of technological innovations made at the participating National Laboratory or single-purpose research facility.

(C) The extent to which the project involves a wide variety and number of institutions of higher education, nonprofit institutions, and technology-related business concerns that can support the missions of the participating National Laboratory or single-purpose research facility and that will make substantive contributions to achieving the goals of the project.

(D) The extent to which the project focuses on promoting the development of technology-related business concerns that are small businesses or involves such small businesses substantively in the project.

(E) Such other criteria as the Secretary determines to be appropriate.

(f) ALLOCATION.—In allocating funds for projects approved under this section, the Secretary shall provide—

(1) the Federal share of the project costs; and

(2) additional funds to the National Laboratory or single-purpose research facility managing the project to permit the National Laboratory or single-purpose research facility to carry out activities relating to the project, and to coordinate such activities with the project.

(g) REPORT TO CONGRESS.—Not later than July 1, 2006, the Secretary shall report to Congress on whether the Technology Infrastructure Program should be continued and, if so, how the program should be managed.

(h) DEFINITIONS.—In this section:

(1) The term ''technology cluster'' means a concentration of technology-related business concerns, institutions of higher education, or nonprofit institutions that reinforce each other's performance in the areas of technology development through formal or informal relationships.

(2) The term ''technology-related business concern'' means a for-profit corporation, company, association, firm, partnership, or small business concern

that conducts scientific or engineering research; develops new technologies; manufactures products based on new technologies; or performs technological services.

(i) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for activities under this section $10,000,000 for each of fiscal years 2004, 2005, and 2006.

SEC. 980. REPROGRAMMING.

(a) DISTRIBUTION REPORT.—Not later than 60 days after the date of the enactment of an Act appropriating amounts authorized under this title, the Secretary shall transmit to the appropriate authorizing committees of the Congress a report explaining how such amounts will be distributed among the authorizations contained in this title.

(b) PROHIBITION.—(1) No amount identified under subsection (a) shall be reprogrammed if such reprogramming would result in an obligation which changes an individual distribution required to be reported under subsection (a) by more than 5 percent unless the Secretary has transmitted to the appropriate authorizing committees of the Congress a report described in subsection (c) and a period of 30 days has elapsed after such committees receive the report.

(2) In the computation of the 30-day period described in paragraph (1), there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than 3 days to a day certain.

(c) REPROGRAMMING REPORT.—A report referred to in subsection (b)(1) shall contain a full and complete statement of the action proposed to be taken and the facts and circumstances relied on in support of the proposed action.

SEC. 981. CONSTRUCTION WITH OTHER LAWS.

Except as otherwise provided in this title, the Secretary shall carry out the research, development, demonstration, and commercial application programs, projects, and activities authorized by this title in accordance with the applicable provisions of the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.), the Federal Nonnuclear Research and Development Act of 1974 (42 U.S.C. 5901 et seq.), the Energy Policy Act of 1992 (42 U.S.C. 13201 et seq.), the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.), chapter 18 of title 35, United States Code (commonly referred to as the Bayh-Dole Act), and any other Act under which the Secretary is authorized to carry out such activities.

SEC. 982. REPORT ON RESEARCH AND DEVELOPMENT PROGRAM EVALUATION METHODOLOGIES.

Not later than 180 days after the date of enactment of this Act, the Secretary shall enter into appropriate arrangements with the National Academy of Sciences to investigate and report on the scientific and technical merits of any evaluation methodology currently in use or proposed for use in relation to the scientific and technical programs of the Department by the Secretary or other Federal official. Not later than 6 months after receiving the report of the National Academy, the Secretary shall submit such report to Congress, along with any other views or plans of the Secretary with respect to the future use of such evaluation methodology.

SEC. 983. DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY SCHOLARSHIP PROGRAM.

(a) ESTABLISHMENT OF PROGRAM.—

(1) IN GENERAL.—The Secretary may establish a Department of Energy Science and Technology Scholarship Program to award scholarships to individuals that is designed to recruit and prepare students for careers in the Department.

(2) COMPETITIVE PROCESS.—Individuals shall be selected to receive scholarships under this section through a competitive process primarily on the basis of academic merit, with consideration given to finan-

cial need and the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(3) SERVICE AGREEMENTS.—To carry out the Program the Secretary shall enter into contractual agreements with individuals selected under paragraph (2) under which the individuals agree to serve as full-time employees of the Department, for the period described in subsection (f)(1), in positions needed by the Department and for which the individuals are qualified, in exchange for receiving a scholarship.

(b) SCHOLARSHIP ELIGIBILITY.—In order to be eligible to participate in the Program, an individual must—

(1) be enrolled or accepted for enrollment as a full-time student at an institution of higher education in an academic program or field of study described in the list made available under subsection (d);

(2) be a United States citizen; and

(3) at the time of the initial scholarship award, not be a Federal employee as defined in section 2105 of title 5 of the United States Code.

(c) APPLICATION REQUIRED.—An individual seeking a scholarship under this section shall submit an application to the Secretary at such time, in such manner, and containing such information, agreements, or assurances as the Secretary may require.

(d) ELIGIBLE ACADEMIC PROGRAMS.—The Secretary shall make publicly available a list of academic programs and fields of study for which scholarships under the Program may be utilized, and shall update the list as necessary.

(e) SCHOLARSHIP REQUIREMENT.—

(1) IN GENERAL.—The Secretary may provide a scholarship under the Program for an academic year if the individual applying for the scholarship has submitted to the Secretary, as part of the application required under subsection (c), a proposed academic program leading to a degree in a program or field of study on the list made available under subsection (d).

(2) DURATION OF ELIGIBILITY.—An individual may not receive a scholarship under this section for more than 4 academic years, unless the Secretary grants a waiver.

(3) SCHOLARSHIP AMOUNT.—The dollar amount of a scholarship under this section for an

academic year shall be determined under regulations issued by the Secretary, but shall in no case exceed the cost of attendance.

(4) AUTHORIZED USES.—A scholarship provided under this section may be expended for tuition, fees, and other authorized expenses as established by the Secretary by regulation.

(5) CONTRACTS REGARDING DIRECT PAYMENTS TO INSTITUTIONS.—The Secretary may enter into a contractual agreement with an institution of higher education under which the amounts provided for a scholarship under this section for tuition, fees, and other authorized expenses are paid directly to the institution with respect to which the scholarship is provided.

(f) PERIOD OF OBLIGATED SERVICE.—

(1) DURATION OF SERVICE.—The Secretary shall determine by a public rulemaking, the period of service for which an individual shall be obligated to serve as an employee of the Department for which a scholarship is provided, except as described in subsection (h).

(2) SCHEDULE FOR SERVICE.—(A) Except as provided in subparagraph (B), obligated service under paragraph (1) shall begin not later than 60

days after the individual obtains the educational degree for which the scholarship was provided.

(B) The Secretary may defer the obligation of an individual to provide a period of service under paragraph (1) if the Secretary determines that such a deferral is appropriate. The Secretary shall prescribe the terms and conditions under which a service obligation may be deferred through regulation.

(g) PENALTIES FOR BREACH OF SCHOLARSHIP AGREEMENT.—

(1) FAILURE TO COMPLETE ACADEMIC TRAINING.—Scholarship recipients who fail to maintain a high level of academic standing, as defined by the Secretary by regulation, who are dismissed from their educational institutions for disciplinary reasons, or who voluntarily terminate academic training before graduation from the educational program for which the scholarship was awarded, shall be in breach of their contractual agreement and, in lieu of any service obligation arising under such agreement, shall be liable to the United States for repayment within 1 year after the date of default of all scholarship funds paid to them and to the institution of higher education on their behalf under the agreement, except as provided in subsection (h)(2). The

repayment period may be extended by the Secretary when determined to be necessary, as established by regulation.

(2) FAILURE TO BEGIN OR COMPLETE THE SERVICE OBLIGATION OR MEET THE TERMS AND CONDITIONS OF DEFERMENT.—Scholarship recipients who, for any reason, fail to begin or complete their service obligation after completion of academic training, or fail to comply with the terms and conditions of deferment established by the Secretary pursuant to subsection (f)(2)(B), shall be in breach of their contractual agreement. When recipients breach their agreements for the reasons stated in the preceding sentence, the recipient shall be liable to the United States for an amount equal to—

(A) the total amount of scholarships received by such individual under this section; plus

(B) the interest on the amounts of such awards which would be payable if at the time the awards were received they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States,

multiplied by 3.

(h) WAIVER OR SUSPENSION OF OBLIGATION.—

(1) DEATH OF INDIVIDUAL.—Any obligation of an individual incurred under the Program (or a contractual agreement thereunder) for service or payment shall be canceled upon the death of the individual.

(2) IMPOSSIBILITY OR EXTREME HARDSHIP.—The Secretary shall by regulation provide for the partial or total waiver or suspension of any obligation of service or payment incurred by an individual under the Program (or a contractual agreement thereunder) whenever compliance by the individual is impossible or would involve extreme hardship to the individual, or if enforcement of such obligation with respect to the individual would be contrary to the best interests of the Government.

(i) DEFINITIONS.—In this section the following definitions apply:

(1) COST OF ATTENDANCE.—The term ''cost of attendance'' has the meaning given that term in section 472 of the Higher Education Act of 1965 (20 U.S.C. 1087*ll*).

(2) INSTITUTION OF HIGHER EDUCATION.—The term ''institution of higher education'' has the

meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(3) PROGRAM.—The term ''Program'' means the Department of Energy Science and Technology Scholarship Program established under this section.

SEC. 984. REPORT ON EQUAL EMPLOYMENT OPPORTUNITY PRACTICES.

Not later than twelve months after the date of enactment of this Act, and biennially thereafter, the Secretary shall transmit to Congress a report on the equal employment opportunity practices at Department of Energy National laboratories. Such report shall include—

(1) a thorough review of each laboratory contractor's equal employment opportunity policies, including promotion to management and professional positions and pay raises;

(2) a statistical report on complaints and their disposition in the laboratories;

(3) a description of how equal employment opportunity practices at the laboratories are treated in the contract and in calculating award fees for each contractor;

(4) a summary of disciplinary actions and their disposition by either the Department or the relevant contractors for each laboratory;

(5) a summary of outreach efforts to attract women and minorities to the laboratories;

(6) a summary of efforts to retain women and minorities in the laboratories; and

(7) a summary of collaboration efforts with the Office of Federal Contract Compliance Programs to improve equal employment opportunity practices at the laboratories.

SEC. 985. SMALL BUSINESS ADVOCACY AND ASSISTANCE.

(a) SMALL BUSINESS ADVOCATE.—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to designate a small business advocate to—

(1) increase the participation of small business concerns, including socially and economically disadvantaged small business concerns, in procurement, collaborative research, technology licensing, and technology transfer activities conducted by the National Laboratory or single-purpose research facility;

(2) report to the Director of the National Laboratory or single-purpose research facility on the actual participation of small business concerns, including socially and economically disadvantaged small business concerns, in procurement, collaborative research, technology licensing, and technology transfer

activities along with recommendations, if appropriate, on how to improve participation;

(3) make available to small businesses training, mentoring, and information on how to participate in procurement and collaborative research activities;

(4) increase the awareness inside the National Laboratory or single-purpose research facility of the capabilities and opportunities presented by small business concerns; and

(5) establish guidelines for the program under subsection (b) and report on the effectiveness of such program to the Director of the National Laboratory or single-purpose research facility.

(b) ESTABLISHMENT OF SMALL BUSINESS ASSISTANCE PROGRAM.—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to establish a program to provide small business concerns—

(1) assistance directed at making them more effective and efficient subcontractors or suppliers to the National Laboratory or single-purpose research facility; or

(2) general technical assistance, the cost of which shall not exceed $10,000 per instance of as-

sistance, to improve the small business concerns' products or services.

(c) USE OF FUNDS.—None of the funds expended under subsection (b) may be used for direct grants to the small business concerns.

(d) DEFINITIONS.—In this section:

(1) The term ''small business concern'' has the meaning given such term in section 3 of the Small Business Act (15 U.S.C. 632).

(2) The term ''socially and economically disadvantaged small business concerns'' has the meaning given such term in section 8(a)(4) of the Small Business Act (15 U.S.C. 637(a)(4)).

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for activities under this section $5,000,000 for each of fiscal years 2004 through 2008.

SEC. 986. REPORT ON MOBILITY OF SCIENTIFIC AND TECHNICAL PERSONNEL.

Not later than 2 years after the date of enactment of this Act, the Secretary shall transmit a report to the Congress identifying any policies or procedures of a contractor operating a National Laboratory or single-purpose research facility that create disincentives to the temporary transfer of scientific and technical personnel among the

contractor-operated National Laboratories or contractor-operated single-purpose research facilities and provide suggestions for improving interlaboratory exchange of scientific and technical personnel.

SEC. 987. NATIONAL ACADEMY OF SCIENCES REPORT.

Not later than 90 days after the date of enactment of this Act, the Secretary shall enter into an arrangement with the National Academy of Sciences for the Academy to—

(1) conduct a study on—

(A) the obstacles to accelerating the commercial application of energy technology; and

(B) the adequacy of Department policies and procedures for, and oversight of, technology transfer-related disputes between contractors of the Department and the private sector; and

(2) transmit a report to the Congress on recommendations developed as a result of the study.

SEC. 988. OUTREACH.

The Secretary shall ensure that each program authorized by this title includes an outreach component to provide information, as appropriate, to manufacturers, consumers, engineers, architects, builders, energy service companies, institutions of higher education, small busi-

nesses, facility planners and managers, State and local governments, and other entities.

SEC. 989. COMPETITIVE AWARD OF MANAGEMENT CONTRACTS.

None of the funds authorized to be appropriated to the Secretary by this title may be used to award a management and operating contract for a nonmilitary energy laboratory of the Department unless such contract is competitively awarded or the Secretary grants, on a case-by-case basis, a waiver to allow for such a deviation. The Secretary may not delegate the authority to grant such a waiver and shall submit to the Congress a report notifying the Congress of the waiver and setting forth the reasons for the waiver at least 60 days prior to the date of the award of such a contract.

SEC. 990. EDUCATIONAL PROGRAMS IN SCIENCE AND MATHEMATICS.

(a) Section 3165(a) of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381b(a)) is amended by adding at the end:

''(14) Support competitive events for students, under supervision of teachers, designed to encourage student interest and knowledge in science and mathematics.''.

(b) Section 3169 of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381e), as so redesignated by this Act, is amended by inserting before the period ''; and $40,000,000 for each of fiscal years 2004 through 2008''.